

City of Charlotte NPDES MS4 Permit Program

Stormwater Management Program Plan

FY2021 Annual Report



Permit Number NCS000240

October 2021

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Acronyms Used in This Document:

AAS:	Adopt-A-Stream
BMP:	Best Management Practice(s)
CAR:	Corrective Action Request(s)
CATS:	Charlotte Area Transit System
CDOT:	Charlotte Department of Transportation
CFD:	Charlotte Fire Department
CITY:	City of Charlotte
CMANN:	Continuous Monitoring Alert Notification Network
CMCSI:	Charlotte-Mecklenburg Certified Site Inspector
CMPD:	Charlotte-Mecklenburg Police Department
CMSWS:	Charlotte-Mecklenburg Storm Water Services
CSWS:	Charlotte Storm Water Services
CSWS-LD:	CSWS-Land Development Team
CW:	Charlotte Water Department (formerly Charlotte-Mecklenburg Utilities)
DO:	Dissolved Oxygen
DWF:	Dry Weather Flow
ETJ:	Extra Territorial Jurisdiction

FY:	Fiscal Year
GIS:	Geographic Information System
IDDE:	Illicit Discharge Detection and Elimination
IDEP:	Illicit Discharge Elimination Program
MEP:	Maximum Extent Practicable
MS4:	Municipal Separate Storm Sewer System
NCDEQ:	North Carolina Department of Environmental Quality
NOD:	Notice of Deficiency
NOV:	Notice of Violation
NPDES:	National Pollutant Discharge Elimination System
O&M:	Operation & Maintenance
PCSO:	Post-Construction Stormwater Ordinance (City)
QA/QC:	Quality Assurance/Quality Control Program
ROW :	Right-of-Way
RSPC :	Regional Stormwater Partnership of the Carolinas
SAP:	Standard Administrative Procedure
SARA:	Superfund Amendments and Reauthorization Act
SCM:	Stormwater Control Measure(s)
SDM :	Storm Drain Marking
SESCO:	Soil Erosion and Sedimentation Control Ordinance (City)
SOP:	Standard Operating Procedure(s)
SPRP:	Spill Prevention and Response Procedures(s)
SSO:	Sanitary Sewer Overflow(s)
SWAC:	Stormwater Advisory Committee
SWMP:	Stormwater Management Program Plan
SWPCO:	Stormwater Pollution Control Ordinance (City)
SWPPP:	Stormwater Pollution Prevention Plan
SWQ:	Surface Water Quality
TMDL:	Total Maximum Daily Load
TSS:	Total Suspended Solids
UNCC:	University of North Carolina at Charlotte
USEPA:	United States Environmental Protection Agency
WLA:	Waste Load Allocation
WQ:	Water Quality
WQS:	Water Quality Standards
WRRI-SWC:	Water Resources Research Institute – Stormwater Consortium
WTP:	Water Treatment Plant
WWTP:	Wastewater Treatment Plant

Section 1: Introduction

On November 1, 1993, the City of Charlotte (“City”) began operating under National Pollutant Discharge Elimination System (“NPDES”) Municipal Separate Storm Sewer System (“MS4”) Permit Number NCS000240. This permit has subsequently been renewed for a 5-year permit term on four occasions and is currently in its 5th permit cycle effective October 10, 2018 through October 9, 2023.

This document provides the Annual Report for the Stormwater Management Program Plan (“SWMP”) for fiscal year (“FY”) 2021 under the current permit term as required by Part III, paragraph 2 and Part IV, paragraph B of the NPDES MS4 permit. The overall objective of this Annual Report is to document activities conducted in support of the SWMP during FY2021 (July 1, 2020 to June 30, 2021), assess program effectiveness, and discuss future proposed program activities and/or SWMP changes as necessary.

The City’s Storm Water Services (“CSWS”) is the primary agency responsible for managing the City’s NPDES MS4 permit, the MS4 system and the SWMP. The implementation of the requirements within the permit program and SWMP are coordinated with other applicable City departments as necessary. In addition, coordination is conducted with the NPDES MS4 permit programs for the jurisdictions in Mecklenburg County adjacent to the City where appropriate and feasible. This coordination is conducted to help ensure uniformity between the local NPDES MS4 stormwater permit programs and jurisdictions. Mecklenburg County stormwater staff along with CSWS staff collectively form Charlotte-Mecklenburg Storm Water Services (“CMSWS”). City and County surface water quality staff within CMSWS work together to accomplish many of the activities discussed in this report.

Included in this SWMP Annual Report are:

- Best management practice(s) (“BMPs”) that are being used to fulfill the program requirements;
- Frequency and status of each BMP;
- Measurable program goals and planned future activities;
- Implementation schedule;
- Responsible positions; and
- An assessment of program activities conducted during the reporting year.

Staff of CSWS, under the direction of the City’s Surface Water Quality and Environmental Permitting Program Manager, is responsible for the fulfillment of most of the activities discussed in this SWMP. Exceptions to this include the CSWS-Land Development Team (“CSWS-LD”), which was the primary group during FY2021 responsible for the Development and Redevelopment Plan Review and Construction Site Stormwater Runoff Control programs within the SWMP. In addition, the City’s Department of Transportation-Street Maintenance Division and Solid Waste Services Department have responsibility for routine maintenance of certain portions of the MS4, in coordination with CSWS. Funding for the BMPs specified in the SWMP

is provided by local stormwater utility fees, except where noted. The City’s SWMP includes the following core permit programs:

1. Public Education and Outreach Program – This program provides the public and businesses with information on surface water quality, pollution prevention, and reporting problems, as well as specialized information on various activities that have the potential to cause pollution and harm surface water quality. This information is delivered through a wide range of methods including print, web, radio, social media, television, presentations, and public events.
2. Public Involvement and Participation Program – This program provides the public and businesses the opportunity to participate in various programs within the City’s SWMP. Charlotte-Mecklenburg government maintains a Storm Water Advisory Committee (“SWAC”), which is an appointed citizen panel to review and comment on the City’s and County’s stormwater programs. In addition, public volunteer opportunities are available with City/County programs such as Storm Drain Marking, Adopt-a-Stream, and the annual Big Spring Clean event.
3. Illicit Discharge Detection and Elimination Program – This program is designed to protect surface water quality by detecting and eliminating pollution sources such as improper sewage or wastewater connections; illegal discharges of chemicals, paint, or oil; and accidental discharges from sanitary sewer lines and vehicle accidents. As part of this program, the City enforces the “City of Charlotte - Stormwater Pollution Control Ordinance,” which prohibits the discharge of pollutants to the storm drainage system and receiving streams. The City relies on reports from the public, various monitoring programs, and a wide range of other activities to assist in identifying and eliminating these sources of pollution.
4. Construction Site Stormwater Runoff Control Program – This program maintains the City’s delegated erosion and sediment control program to control sediments and other pollutants from construction sites. As part of this program, the City enforces the “City of Charlotte - Soil Erosion and Sedimentation Control Ordinance,” which requires suitable erosion control on project sites. The City conducts routine inspections of construction sites and issues violation notices and fines when necessary to ensure compliance with the ordinance.
5. Post-Construction Stormwater Management Program – This program is designed to control the discharge of pollutants in stormwater runoff from new development and redevelopment projects. As part of this program, the City enforces the “City of Charlotte – Post-Construction Stormwater Ordinance,” which requires structural stormwater controls for applicable new development and redevelopment projects as defined in the ordinance. The program involves review and approval of project plans as well as site inspections and maintenance activities to ensure that treatment practices are properly operated and maintained.
6. Pollution Prevention/Good Housekeeping Program – This program focuses on ensuring that City facilities and field operations are managed in a way that minimizes stormwater pollutant

discharges. Stormwater Pollution Prevention Plans and Spill Response Plans are maintained for applicable facilities that conduct activities with the potential for stormwater pollutant discharges. The City conducts inspections and training sessions at these facilities to ensure that requirements are being met. Field operations are evaluated for impacts on stormwater quality and best management practices are developed and implemented in order to minimize those impacts.

7. Program to Monitor and Control Pollutants in Stormwater Discharges to Municipal Systems – This program focuses on industrial facilities that discharge stormwater to the City’s MS4 and receiving streams. Inspections are conducted at these facilities on a rotational basis to review site operations and materials handling practices. In addition, if the facility has a stormwater permit, it is reviewed to ensure that permit conditions are adhered to.
8. Water Quality Assessment and Monitoring Program – This program maintains a surface water quality monitoring plan designed to monitor major streams to determine surface water quality conditions and assist in evaluating the effectiveness of various stormwater management programs. The program is also used to assist in locating illicit discharges and connections where possible.
9. Total Maximum Daily Load (“TMDL”) Program – This program maintains a TMDL watershed plan designed to address applicable TMDL pollutants of concern by implementing best management practices (BMPs) within the six minimum NPDES stormwater permit measures. These BMPs are designed to reduce the TMDL pollutant of concern within the Permittee’s assigned MS4 NPDES regulated waste load allocation to the maximum extent practicable (“MEP”), and to the extent authorized by law.

Note: Due to the Coronavirus COVID-19 pandemic of 2020-2021 and resulting restrictions placed by the State of North Carolina and Mecklenburg County, many of the programs discussed in this report have experienced reduced ability to be implemented fully and, therefore, data results reported for FY2021 may be lower, on average, than those reported in previous annual report years.

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Section 2: Background Information

2.1 Population Served

The SWMP covers the jurisdictional area, including the incorporated area and extra territorial jurisdiction (ETJ), for the City of Charlotte, as applicable and defined by the NPDES MS4 permit. **Table 2-1** provides the population for the City of Charlotte based on the 2000 and 2010 US census. This census data was obtained from the following website of the US Census Bureau:

<https://www.census.gov/quickfacts/table/PST045216/3712000,00>

Table 2-1: Population and Growth Rate for the City of Charlotte.

2019 Population (estimated)	2010 Population	2000 Population	Average Annual Percent Change (2010-2019)
885,708	731,424	540,828	2.34%

2.2 Growth Rate

Table 2-1 shows the population growth rate represented as an “Average Annual Percent Change” for the City of Charlotte. This growth rate was calculated by dividing the overall percent change between the 2010 and 2019 Census data by the 9-year interval period.

2.3 Jurisdictional and MS4 Service Areas

The jurisdictional and MS4 service area for the City is provided in **Table 2-2**. The location of this area within Mecklenburg County and corresponding watershed areas is provided in **Figure 2-1**. The source of this information is the City of Charlotte Planning, Development and Design Department, which updates jurisdictional and geographical boundaries as annexations occur.

Table 2-2: Jurisdictional and MS4 Service Area for the City of Charlotte.

Incorporated Area (Sq. Miles)	ETJ (Sq. Miles)	Total Jurisdiction (Sq. Miles)
309	67	376

2.4 MS4 Conveyance System

The existing MS4 serving the City is composed of street curbs, gutters, catch basins, culverts, pipes, ditches, and outfalls that collect and convey stormwater for discharge to receiving streams. The City’s current inventory collection system includes data on approximately 6,322 outfall points, 180,049 structures (inlets, junctions, and outlets), and 2,498 miles of storm drain pipe. Pipe systems are typically 15 inches or larger in diameter and are designed for the ten-year storm event. Outlet energy is commonly dissipated through the use of end-walls or flared end sections with riprap aprons. Although the natural alignment of many receiving streams has been altered over the past century, many of the stream banks remain mostly vegetated as a result of the City’s stormwater management philosophies. Stream banks that were previously armored with riprap are currently allowed to re-vegetate naturally, and new projects incorporate “soft” methods involving tree plantings and other vegetation.

Maintenance and improvements to the MS4 system are funded by stormwater utility fees collected within the City. Maintenance activities include cleaning inlets of debris and sediment, maintaining channels to reduce erosion and maximize pollution reduction capabilities, and the removal of blockages. Improvements to the MS4 system include solving infrastructure problems, channel stabilization, safety improvements, stream habitat enhancement, surface water quality enhancement, and resolving flooding problems associated with stormwater generated from public streets.

2.5 Land Use Composition Estimates

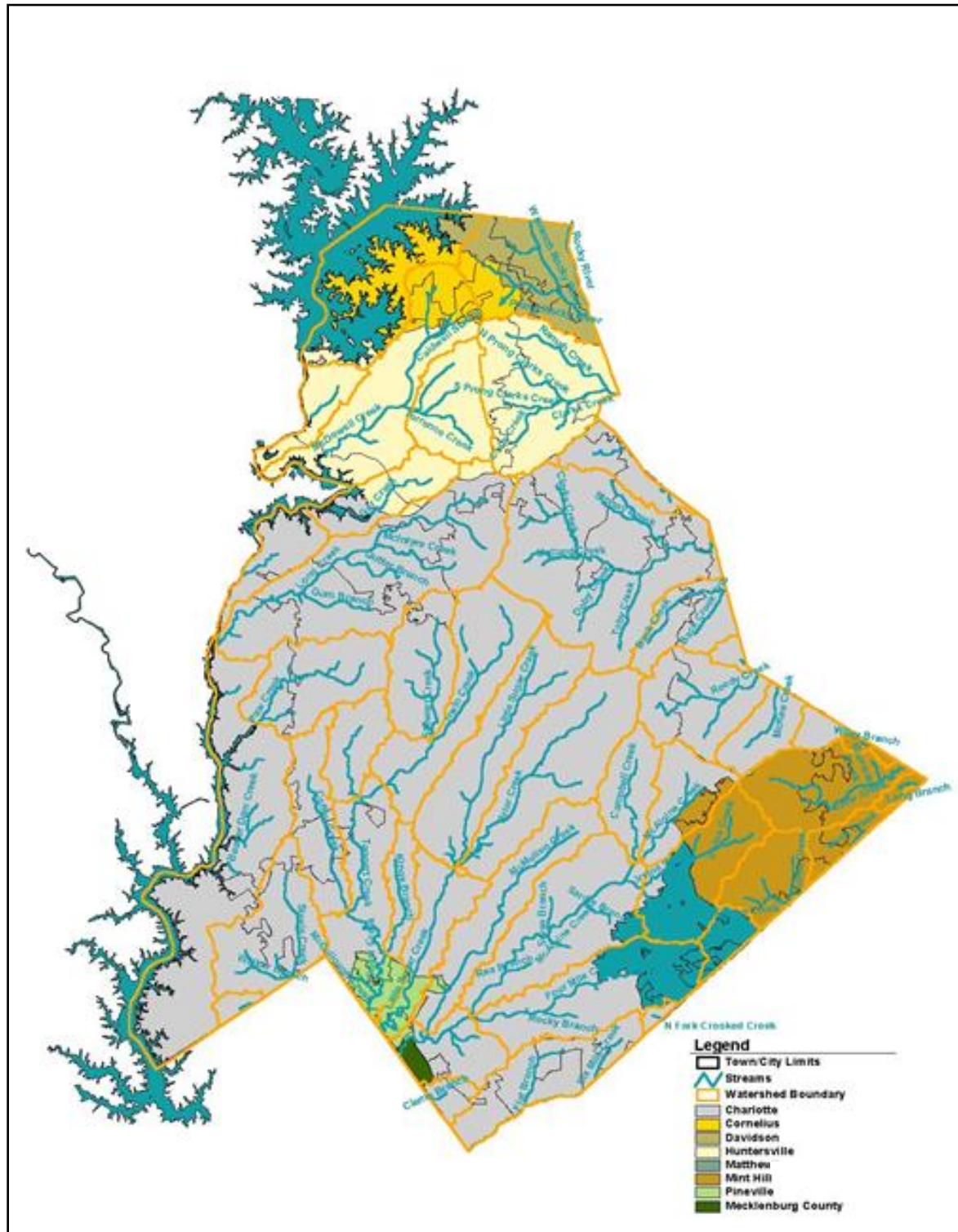
The number of square miles and percentage of the MS4 service area under residential, commercial, industrial and open space land use categories are provided in **Table 2-3**. These percentages include the incorporated area and ETJ for the City. Land use estimates are derived from Mecklenburg County land parcel geographic information system (GIS) data (2019).

Table 2-3: Percentage of Land Uses in the City of Charlotte (including ETJ).

Land use Category	Number of Square Miles	% of Land Use within City of Charlotte
Residential	132	35
Commercial	56	15
Industrial	13	4
Open Space	98	26
Institutional	20	5
Transportation/Other	54	14
Lake Water/Open Space	3	1

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FIGURE 2-1
Charlotte Jurisdictional Area and Watersheds



2.6 Receiving Waters

Approximately two-thirds of the City of Charlotte land area drains west in the Catawba River Basin while the remaining one-third drains east in the Yadkin-Pee Dee River Basin. MS4 receiving stream information by river basin is provided in **Table 2-4** (Catawba) and **Table 2-5** (Yadkin-Pee Dee). The information for the development of these tables was obtained from the 2018 Category 5 303(d) List. The location of the watershed areas in the City of Charlotte is illustrated in **Figure 2-1**.

Table 2-4: Catawba River Basin Streams

Receiving Stream Name	Stream Segment Index #	WQ Classification	Use Support Rating	WQ Issues (303(d) Listing)
Catawba River (Mountain Island Lake below elevation 648)	11-(114)	WS-IV, B, CA	Impaired	PCB Fish Tissue Advisory ⁽⁵⁾
Catawba River (Lake Wylie below elevation 570)	11-(117)	WS-IV-CA	Impaired	PCB Fish Tissue Advisory ⁽⁵⁾
Catawba River (Lake Wylie below elevation 570)	11-(122)	WS-IV, B, CA	Impaired	PCB Fish Tissue Advisory ⁽⁵⁾
Catawba River (Lake Wylie below elevation 570)	11-(123.5)	WS-IV, B	Impaired	PCB Fish Tissue Advisory ⁽⁵⁾
Long Creek	11-120-(0.5)	C	Not Rated	None
Long Creek	11-120-(2.5)	WS-IV	Not Rated	None
Dixon Branch	11-120-1	C	Not Rated	None
McIntyre Creek	11-120-3-(1)	C	Not Rated	None
McIntyre Creek	11-120-3-(2)	WS-IV	Not Rated	None
Gutter Branch	11-120-4-(1)	C	Not Rated	None
Gutter Branch	11-120-4-(2)	WS-IV	Not Rated	None
Gum Branch	11-120-5	WS-IV	Not Rated	None
Paw Creek	11-124	C	Not Rated	None
Ticer Branch	11-124-1	C	Not Rated	None
Little Paw Creek	11-125	C	Not Rated	None
Beaverdam Creek	11-126	C	Not Rated	None
Stowe Branch	11-127	C	Not Rated	None
Porter Branch	11-133	C	Not Rated	None
Studman Branch	11-134	C	Not Rated	None
Sugar Creek	Portions of 11-137a,b,c	C	Impaired	Fecal Coliform ^(4t) ; Turbidity ^(1t) ; Benthos Impairment ⁽⁵⁾
Irwin Creek	11-137-1	C	Impaired	Dissolved Oxygen ^(1t) ; Fecal Coliform ^(4t) ; Turbidity ^(4t) ; Fish impairment
Stewart Creek	11-137-1-2	C	Not Rated	None
Taggart Creek	11-137-2	C	Not Rated	None
Coffey Creek	11-137-4	C	Not Rated	None
Kings Branch	11-137-6	C	Not Rated	None
McCullough Branch	11-137-7	C	Impaired	Benthos impairment

Receiving Stream Name	Stream Segment Index #	WQ Classification	Use Support Rating	WQ Issues (303(d) Listing)
Little Sugar Creek	11-137-8	C	Impaired	Copper ⁽⁵⁾ Mercury ⁽⁵⁾ Turbidity ^(1t) Dissolved Oxygen ^(1t) ; Fecal Coliform ^(4t) ; Benthos impairment ^(4s)
Dairy Branch	11-137-8-1	C	Not Rated	None
Briar Creek	11-137-8-2	C	Not Rated	None
Edwards Branch	11-137-8-2-1	C	Not Rated	None
Little Hope Creek	11-137-8-3	C	Not Rated	None
McAlpine Creek	11-137-9	C	Impaired	Dissolved Oxygen ^(1t) ; Fecal Coliform ^(4t) ; Turbidity ^(1t) ; Benthos and fish impairment ⁽⁵⁾
Campbell Creek	11-137-9-1	C	Not Rated	None
Irvins Creek	11-137-9-2	C	Not Rated	None
Fourmile Creek	11-137-9-4	C	Not Rated	None
Rocky Branch	11-137-9-4-1	C	Not Rated	None
McMullen Creek	11-137-9-5	C	Impaired	Benthos impairment ⁽⁵⁾
Steele Creek	11-137-10	C	Not Rated	None**
Walker Branch	11-137-10-1	C	Not Rated	None
Polk Ditch	11-137-10-1-1	C	Not Rated	None
Clems Branch	11-137-11	C	Not Rated	None
Sixmile Creek	11-138-3	C	Impaired	Fish impairment ⁽⁵⁾
Twelvemile Creek	11-138	C	Impaired	Dissolved Oxygen ⁽⁵⁾ ; Copper ⁽⁵⁾ ; Turbidity ⁽⁵⁾ ; Fish impairment ^(4s)
Flat Branch	11-138-3-2	C	Not Rated	None

Table 2-5: Yadkin-Pee Dee River Basin Streams

Receiving Stream Name	Stream Segment Index #	WQ Classification	Use Support Rating	WQ Issues (303(d) Listing)
Mallard Creek	13-17-5b	C	Impaired	Turbidity ⁽⁵⁾
Clarks Creek	13-17-5-2	C	Impaired	Benthos impairment ⁽⁵⁾
Doby Creek	13-17-5-3	C	Impaired	Benthos impairment ⁽⁵⁾
Toby Creek	13-17-5-4	C	Impaired	Benthos impairment ⁽⁵⁾
Stony Creek	13-17-5-5	C	Impaired	Benthos impairment ⁽⁵⁾
Back Creek	13-17-7	C	Impaired	Benthos impairment ⁽⁵⁾
Fuda Creek	13-17-7-1	C	Not Rated	None
Reedy Creek	13-17-8	C	Impaired	Benthos impairment ^{(5)*}
McKee Creek	13-17-8-4	C	Impaired	Fecal Coliform ^(4t) ; Benthos impairment ⁽⁵⁾

Use Support Ratings
^(1t) No criteria exceeded but approved TMDL for parameter of interest

^(4s) Impaired biological integrity with an identified Aquatic Life Standards Violation listed in Category 5

^(4t) Designated use impaired with an approved TMDL

⁽⁵⁾ Designated use impaired because of biological or ambient surface water quality standards violations and needing a TMDL

** Listed as impaired on South Carolina 303(d) list for Fecal Coliform; TMDL developed May 2007.

Source: North Carolina's 2018 303(d) Report

Section 3: Public Education and Outreach Program

During the annual report period, the Public Education and Outreach Program distributed educational information to the community and conducted outreach activities focused on the impacts of stormwater discharges on water bodies per the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Target audience and pollution sources;
- Outreach strategy;
- Measures of success;
- Future goals and planned activities; and
- Program assessment.

3.1 BMP Summary Table

Table 3-1 provides information concerning the BMPs implemented to fulfill the Public Education and Outreach Program requirements.

Table 3-1: BMP Summary Table for the Public Education and Outreach Program.

BMP	BMP Description	Schedule (years)					Responsible Position
		1	2	3	4	5	
Describe target pollutants and target pollutant sources	Describe the target pollutants and target pollutant sources the permittee's public education program is designed to address and why they are an issue.	X	X	X	X	X	Water Quality Program Manager
Describe target audiences	Describe the target audiences likely to have significant stormwater impacts and why they were selected.	X	X	X	X	X	Water Quality Program Manager
Informational Web Site	The permittee shall promote and maintain an internet web site designed to convey the program's message.	X	X	X	X	X	Water Quality Program Manager
Distribute public education materials to identified user groups.	Distribute general stormwater educational material to appropriate target groups as likely to have a significant stormwater impact.	X	X	X	X	X	Water Quality Program Manager
Promote and maintain Hotline/Help line	Promote and maintain a stormwater hotline(s) or helpline(s) for the public to request information about stormwater, public involvement & participation, and to report illicit connections & discharges, etc.	X	X	X	X	X	Water Quality Program Manager
Implement a Public Education and Outreach Program.	The permittee's outreach program, including those elements implemented locally or through a cooperative agreement, shall include a combination of approaches designed to reach the target audiences. For each media, event, or activity the permittee shall estimate and record the extent of exposure.	X	X	X	X	X	Water Quality Program Manager

3.2 Target Pollutants and Sources

Table 3-2 provides the specific pollution sources targeted for the public education program as well as a description as to why the sources are important for protecting surface water quality in the City.

Table 3-2: Targeted Pollution Sources for the Public Education and Outreach Program.

Target Pollutant	Pollution Source	Issue
Bacteria	Improper Waste Disposal Sanitary Sewer Overflows Pet Waste	Many surface waters in Charlotte are impaired due to high fecal coliform levels. Improper handling and disposal of wastes can result in the discharge of a variety of pollutants to the storm drainage system, causing increases in harmful bacteria. Discharges of food wastes such as fats, oils, and greases to the sanitary sewer system can result in line blockages that cause sanitary sewer overflows. Improper disposal of pet waste can also cause discharges of bacteria to the storm drainage system.
Sediment	Construction Erosion Stream Bank Erosion	Many surface waters in Charlotte are impaired due to turbidity related to sediment discharges. Improper erosion control practices at construction sites can result in sediment discharges to the storm drainage system. In addition, uncontrolled volumes of stormwater runoff can cause scouring of stream banks resulting in increased sediment volumes in streams.

3.3 Target Audiences

The City’s public education and outreach program reaches a fairly broad representation of the city’s population through various methods as explained in Section 3.4 with the goal of reaching certain target audiences for particular reasons as explained below. The target audiences are evaluated with each annual SWMP update and as part of the development of the SWMP following permit renewal.

Multi-Family Residential Apartment Complexes: This target audience is selected because private sanitary sewer systems at apartment complexes are often not well-maintained and have been found to be significant contributors to sanitary sewer overflow(s) (“SSOs”) in the municipal sewer system due to improper disposal of grease and other items by apartment residents. Outreach efforts to multi-family communities are described further in Section 5 of this report.

Construction Industry: This target audience is selected because it has the greatest potential for affecting erosion and sedimentation control at construction sites, which can be a significant contributor of sediment to the City’s waterways. Outreach efforts to the construction industry are described further in Section 6 of this report.

Commercial Sectors: Various commercial sectors are targeted for education each year due to the significant negative impacts they can have on surface water quality by improperly handling and disposing of wastes and practicing poor housekeeping at their facilities. Each year an evaluation of previous pollution service requests, illicit discharges, and notices of violation is conducted to

determine which commercial sectors are commonly demonstrating non-compliance. Based on that evaluation, education and outreach efforts are focused on particular sectors for a certain time period, typically a fiscal year. Outreach efforts to commercial sectors are described in this section and Section 5 of this report.

School-aged Children: Children are very important when it comes to protecting surface waters. They play in creeks and lakes and, therefore, want to protect them. They bring home what they learn and encourage their parents to adopt positive behaviors for protecting surface water quality. Lessons about surface water quality and stormwater pollution often fit into and enhance science learning principles required by school curricula. Also, teaching children instills a sense of responsibility for the environment that can carry forward and grow into their adult lives. For these reasons, the City’s public education program focuses significant resources on teaching students at various grade levels.

Pet Owners: Pet waste is identified as a significant source of bacteria in surface waters, so starting during FY2018, CMSWS added pet owners as a target audience as one way to help combat elevated fecal coliform counts in local creeks.

Diverse and under-represented audiences: CMSWS has also been exploring and implementing ways to educate an even more diverse representation of our population. Research and strategizing have been done to establish priorities and determine effective methods for sharing water quality messages with various audiences and getting more of them involved in volunteering and advocating for protection of water resources. Staff work each year to implement efforts and programs for reaching out to diverse and under-represented audiences.

3.4 Stormwater Public Education and Outreach Program

The City’s Stormwater Public Education and Outreach Program provides surface water quality and pollution prevention messages to educate residents and businesses about the ways they can help protect surface water quality and get involved to help reduce stormwater pollution. The program provides these messages in the following ways:

- Mass Media;
- Social Media;
- Public Hotline Promotion;
- School Presentations;
- Public Presentations and Events;
- Website;
- Public Education Materials; and
- Special Campaigns and Programs.

3.4.1 Mass Media

Significant resources are spent on providing surface water quality messages through mass media channels because they are one of the most effective ways to reach adult audiences. The media campaign focuses on four main themes:

- Surface Water Quality;
- Volunteering;
- Flood Safety; and
- Aging Infrastructure.

Media channels utilized to promote events and messages consist of television, radio, and website advertisements. During previous years, print advertisements were also used; however, public opinion survey results have shown that these advertisements are seen less frequently and are less effective.

Print media for the City’s program currently includes the use of:

- Environmental notices/brochures; and
- Utility bill inserts

Table 3-3 shows the data relative to these media channels for the report period.

Table 3-3: Mass Media, Social Media, and Website Program Results

Activity	Results
Television advertising spots run	310
Radio advertising spots run	353
Television advertising media impressions	2,930,665
Radio advertising media impressions	1,229,400
Website advertisements run	42
Website advertising media impressions	3,448,030
Environmental notices/brochures issued	14
Utility bill inserts (stormwater related) mailed	1,407,000
Facebook fans	7,456
Instagram followers	1,140
Twitter followers	1,352
YouTube page subscribers	106
Social media posts made	986
Total Social media engagements (likes, replies, comments, shares)	14,819
CLT+ mobile app downloads	7,798
Public requests to hotline received (stormwater related)	7,810
Public requests to hotline (SWQ related)	445
Website page views	417,437
Website unique page views	176,924

3.4.2 Social Media

CMSWS continues efforts to build a social media presence as more and more people are receiving information through this media source. Four social media channels used by CMSWS are shown in **Table 3-4**.

Table 3-4: Social Media Channels

Social Media Account	Name	Handle	URL
Facebook	CMSWS	@StormWaterCM	https://www.facebook.com/StormWaterCM
Twitter	CMSWS	@StormWaterCM	https://twitter.com/StormWaterCM
Instagram	CMSWS	@StormWaterCM	https://www.instagram.com/stormwatercm/
YouTube	CMSWS	N/A	https://www.youtube.com/user/StormWaterServices

CMSWS posts various videos and news stories on its YouTube channel. CMSWS also provides more content, pictures and videos related to stormwater pollution, surface water quality, pollution prevention and flood messages on Facebook, Twitter and Instagram and boosts some posts to reach tens of thousands of users, all aimed at reflecting the diversity of the community. **Table 3-3** shows the data relative to social media channels for the report period.

3.4.3 Public Reporting Mechanisms

The City, in cooperation with Mecklenburg County, operates a joint customer service hotline to receive information about a variety of concerns. Citizens can call 311 to report pollution, flooding, and blockages to the drainage system as well as request other City/County services. The 311-call center is staffed to receive calls Monday through Friday from 7 am to 7 pm. Citizens can also submit requests for service to 311 at any time by using the CLT+ app or by going online to the “Report a Problem” section of the website. All personnel from the customer service group receive training on stormwater issues and pollution to ensure calls are directed to appropriate personnel and handled in a timely manner. The training manual for 311 staff is reviewed and updated periodically to ensure information and resources are accurate.

A variety of methods and events are used to promote the 311-reporting hotline and other reporting options including:

- Giving away promotional products such as magnets and water bottles with CMSWS logo and 311 information;
- Providing information about reporting pollution on CMSWS website;
- Working with local TV stations to produce news segments focused on reporting pollution;
- Buying media time and airing TV advertisements focused on reporting pollution;
- Designing and mailing the utility bill inserts focused on various program topics and activities; and
- Implementing vehicle wraps.

The 311-call center refers calls for stormwater general, structural, and flooding concerns to CSWS while surface water quality concerns are referred to CMSWS. **Table 3-3 and Table 3-5**

provide information about the number and type of callers that reported stormwater and surface water quality issues.

Table 3-5: Surface Water Quality Service Request Source Summary

Caller Type	Service Requests
Public Citizen	267
Business	6
Charlotte Fire Department staff	26
Charlotte-Mecklenburg Police Department staff	2
Charlotte Storm Water Services staff	40
Charlotte Water staff	25
Mecklenburg County Storm Water Services staff	48
State – NCDEQ staff	5
Environmental Protection Agency/NRC	1
Other	25
TOTAL	445

3.4.4 School Presentations

Due to the 2021 COVID-19 pandemic, many school presentations were moved to a digital format and staff created Facebook LIVE events. This allowed CMSWS to continue to get out messages, even to those children that were not in schools due to the stay at home order. Teachers were also able to review the Enviroscape presentation and give the presentation themselves. The different programs available include:

- Blue Planet (also offered virtually);
- Common Water;
- Freddie the Fish (also offered virtually);
- Enviroscape Model and Video Demonstration;
- Flood Plain Model Demonstration
- Continuous Monitoring Alert Notification Network (“CMANN”) Demo and Power Point;
- Festival Table Demonstrations;
- Career Day A Day in the Life of Water Quality Staff; and
- Macroinvertebrate Identification.

Two stormwater pollution videos (made by a former local meteorologist) and the Enviroscape model are also available on loan to schools upon their request. **Table 3-6** shows the data relative to the school presentations for the report period.

3.4.5 Public Presentations and Workshops

A variety of surface water quality presentations and workshops are available from CMSWS to the public, interest groups, businesses and industrial facilities upon request. Each presentation, while similar in nature, is also changed depending on the topic of interest and the audience receiving the presentation. For example, presentations on topics such as yard waste, food grease,

pollution prevention, surface water quality information, and landscaping tips are typically available. **Table 3-6** shows the data relative to the public presentations for the report period.

3.4.6 Public Events

CMSWS staff participates in a variety of community events that are used to promote education campaigns, give away promotional products, provide face-to-face education opportunities, and provide formal presentations on surface water quality topics when appropriate. **Table 3-6** shows the data relative to public event participation for the report period.

Table 3-6: Presentation and Event Program Results

Activity	Results
School presentations conducted	40
Students educated at school presentations	2,081
Public presentations conducted	29
Citizens educated at public presentations	1,211
Public events participated in	5
Citizens interacted with at public events	50

3.4.7 Informational Website

A significant number of resources are utilized to promote and maintain the CMSWS website Stormwater.CharMeck.org which continues to be one of the best ways to provide the public with surface water quality information. A vast amount of information is provided on this website including, but not limited to, pollution prevention fact sheets, activities and lessons for kids, volunteer activities, sediment and erosion, regulations, data, maps, watershed information, and stormwater projects. **Table 3-3** shows the number of website page views and the number of unique page views (i.e. the number of times a page is accessed at least once during a browsing session).

3.4.8 Public Education Materials

This outreach mechanism is used to target specific pollution sources associated with the public and industrial/commercial facilities including lawn care practices, handling of used oil and other automotive wastes, housekeeping techniques, etc. Public outreach materials consist of environmental notices and brochures and are also used to increase public reporting of pollution problems. Separate notices/brochures are written for over 30 different topics related to stormwater pollution and are available to staff for distribution during citizen requests for service. A number of these notices/brochures are available in Spanish and CMSWS offers translation services in other languages as well. **Table 3-3** shows the number of environmental notices/brochures distributed for the report period.

3.4.8.1 Promotional Items

Promotional items are designed and distributed to complement outreach activities such as group presentations, workshops and public events. All promotional items have the CMSWS website and include other messages as space allows. **Table 3-7** shows the promotional items distributed.

Table 3-7: Promotional Items

Promotional Item	Message
Ink Pens	Six rotating messages – report pollution, street to stream, volunteer, turn around don't drown, flooding can happen anywhere, buy flood insurance
Umbrella Rain Gauge	General stormwater information; Stormwater.CharMeck.org
Flashlight	General stormwater information; Stormwater.CharMeck.org
Sunscreen	General stormwater information; Stormwater.CharMeck.org
Stormy's Guide to Stormwater Coloring Book	General stormwater information
Hand Sanitizer	Stormwater.CharMeck.org
Stormy Stickers & Temporary Tattoos	General stormwater information; Stormwater.CharMeck.org

3.4.8.2 Utility Bill Inserts

CMSWS includes utility bill inserts in various monthly water/sewer utility bills issued by Charlotte Water (CW) department. The inserts focus on various topics which include typically volunteering, surface water quality, flooding, infrastructure and CMSWS services and fee changes. **Table 3-3** shows the total number of stormwater related utility bill inserts that were mailed during the report period.

3.4.9 Regional Stormwater Partnership

The City is an active member of the Regional Stormwater Partnership of the Carolinas ("RSPC"); a partnership which includes 21 municipalities throughout the region that collaborate on meeting NPDES MS4 permit requirements, particularly education and outreach initiatives. Formed in 2006 and originally comprised of professionals from six municipalities in the Charlotte metropolitan area, the RSPC was developed as a forum for stormwater professionals to work collaboratively on local stormwater issues.

The RSPC's media campaign runs television, radio and web-based television advertisements to educate the regional public. **Table 3-8** shows the data relative to these advertisements as well as other initiatives for the report period.

Table 3-8: Regional Stormwater Partnership Program Results*

Activity	Results*
Television advertising spots run	603
Radio advertising spots run	80
Television advertising media impressions (regular)	2,473,000

Television advertising media impressions (web based)	327,891
Radio advertising media impressions	270,400
Educational workshops conducted	5
Attendees at workshops conducted	796
Educators contacted about RSPC available resources	285
RSPC website visits	4,795
RSPC website new users	3,461

* This data not included in summary data shown in Table 3-11

3.4.10 Special Campaigns and Programs

Pet Waste Campaign: CMSWS conducts a “Scoop the Poop” awareness campaign that targets pet owners as a way to educate them about surface water quality impacts from pet waste and the importance of cleaning it up. This program includes many components to promote awareness such as posting signs that provide information about harmful impacts to surface water quality and human health. The campaign also includes social media posts on Facebook, Instagram, and Twitter to promote pet waste awareness.

Vehicle Wraps: Vehicle wraps (there are currently three) are a unique outreach tool for publicizing stormwater issues. The wraps serve to make a connection between clean water and healthy aquatic life; address the street to stream connection; smelly streams; and mud pollution. In addition to informing and educating, these wraps encourage residents to recognize and report pollution by calling 311.

Stormy Mascot: CMSWS uses the mascot “Stormy the Turtle” in various education and outreach materials and in appearances at various events including parades, photo shoots, and festivals. **Table 3-9** shows the data relative to this program for the report period.

Creek Week: CMSWS participates in a nationwide program called Creek Week in order to bring more attention to the importance of creeks in the community. CMSWS partners with several other governmental and non-profit organizations to develop and market events that tie into the overall surface water quality theme. A logo is used, and events are held including several story times at libraries, a volunteer monitoring workshop, a stream restoration educational walk, and various stream cleanups and educational workshops. During FY2021, Creek Week was minimized due to COVID-19 but there were several volunteer events throughout the week. On social media, the week focused on watersheds that are impaired and highlighted a different watershed daily, providing facts and general information about the streams. **Table 3-9** shows the data relative to this program for the report period.

Table 3-9: Special Campaign and Activity Program Results

Activity	Results
Stormy Mascot appearances at events	0
Creek Week events held	15

3.5 Measurable Goals/Planned Activities for Future Program Years

Table 3-10 describes the various Public Education and Outreach BMPs and the Measurable Goals and Planned Activities for Future Program Years for each BMP by permit term year.

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Table 3-10: BMP Measurable Goals for the Public Education and Outreach Program.

BMP	BMP Description	Measurable Goals (by permit term year)				
		1	2	3	4	5+
Describe target pollutants and target pollutant sources	Describe the target pollutants and target pollutant sources the permittee’s public education program is designed to address and why they are an issue.	Identify target pollution sources utilizing monitoring and service request data	Review and update target pollution sources as necessary. (On-going, years 2 – 5+)			
Describe target audiences	Describe the target audiences likely to have significant stormwater impacts and why they were selected.	Identify target audiences to adopt desired surface water quality improvement behaviors	Review and update target audiences as necessary. (On-going, years 2 – 5+)			
Informational Web Site	The permittee shall promote and maintain an internet web site designed to convey the program’s message.	Continue to maintain an informational website to provide program information to the public. (On-going, years 1 – 5+)				
Distribute public education materials to identified user groups.	Distribute general stormwater educational material to appropriate target groups as likely to have a significant stormwater impact. Instead of developing its own materials, the permittee may rely on state-supplied Public Education and Outreach materials, as available, when implementing its own program.	Distribute educational materials at public events, workshops and presentations. (On-going, years 1 – 5+)				
Promote and maintain Hotline/Help line	Promote and maintain a stormwater hotline/helpline.	Maintain a hotline that receives information from the public 24 hours a day. (On-going, years 1 – 5+)				
Implement a Public Education and Outreach Program.	The permittee’s outreach program, including those elements implemented locally or through a cooperative agreement, shall include a combination of approaches designed to reach the target audiences. For each media, event or activity, including those elements implemented locally or through a cooperative agreement the permittee shall estimate and record the extent of exposure.	Continue to implement a plan to conduct education & outreach activities, including a media campaign, that address target pollutants and audiences. (On-going, years 1 – 5+)				

3.6 Program Assessment

The measurable goals in Table 3-10 for the Public Education and Outreach Program were successfully accomplished during the annual report period. Information in Section 3 provides more detailed information about implementation efforts. **Table 3-11** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 3-11: Program Summary

PUBLIC EDUCATION PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
Advertising spots (TV and Radio)	924	731	663			
Advertising media impressions (TV and Radio)	6,063,651	6,970,584	4,160,065			
Utility bill inserts (stormwater related)	1,330,520	1,530,000	1,407,000			
Social Media Followers/Subscribers	8,927	9,340	10,054			
Social media posts	620	648	986			
Social media responses	1,045	1,240	14,819			
Public requests to hotline (stormwater related)	8,934	9,104	7,810			
Public requests to hotline (SWQ related)	553	605	445			
Presentations	135	55	29			
Persons educated at presentations	3,492	2,088	1,211			
Public events	33	8	5			
Citizens interacted with at public events	3,970	1,860	50			
Website page views	376,617	381,610	417,437			

Overall: A combination of evaluation tools indicates that the City’s residents were successfully being exposed to surface water quality education messages. Staff has developed plans and done research on potential methods that can be used to reach more diverse audiences and expand the outreach program. The following provides more detail regarding some of the numbers reported above.

Target Pollutants and Audiences: The target pollutants for the education and outreach program are bacteria and sediment because these two pollutants are the primary pollutants causing impairment in local surface waters. As such, efforts are focused on target audiences and primarily aimed at reducing these target pollutants as well as other pollutants.

Mass Media: CMSWS utilized traditional media such as television and radio as well as website advertisements and social media.

Utility Bill Inserts: Seven utility bill inserts were created which was one more than the year before.

Public Events & Public Presentations: The number of presentations, public events and citizen interactions decreased. This is due to COVID -19 related cancellations.

School Presentations: The number of school presentations and students educated increased this fiscal year. This is due to virtual school presentation options.

Website Page views: The number of website page views increased this fiscal year.

Social Media: With social media becoming an increasingly used source of information for many people, CMSWS has focused more resources on this method of public education and outreach. An additional 300 posts were made during FY2021 compared to FY2020 and the number of responses dramatically increased by almost 1,100% over last year. We also gained an additional 714 followers/subscribers.

Public Requests: Calls from citizens as a group made up 60% of all calls, which was 50% higher than from the next most frequent caller type, Mecklenburg County Storm Water Services staff, which accounted for 10% of calls. This is important information for targeting education campaigns related to pollution reporting.

Public Opinion Survey Results: A Public Opinion Survey is conducted annually in order to gather data on our outreach campaigns. Of the respondents, 40% recall seeing information from CMSWS during the last 12 months. Utility bill inserts and television were the top two ways people received program information which is consistent with utility bill inserts and television being the top two preferred methods of communication.

Section 4: Public Involvement and Participation Program

During the annual report period, the Public Involvement and Participation Program provided opportunities for the public to participate in program development and implementation per the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Target audiences;
- Volunteer opportunities;
- Public involvement mechanisms;
- Measures of success;
- Future goals and planned activities; and
- Program assessment.

4.1 BMP Summary Table

Table 4-1 provides information concerning the BMPs implemented to fulfill the Public Involvement and Participation Program requirements.

Table 4-1: BMP Summary Table for the Public Involvement and Participation Program.

BMP	BMP Description	Schedule (years)					Responsible Position
		1	2	3	4	5	
Volunteer community involvement program	The permittee shall include and promote volunteer opportunities designed to promote ongoing citizen participation.	X	X	X	X	X	Water Quality Program Manager
Establish a Mechanism for Public involvement	The permittee shall provide and promote a mechanism for public involvement that provides for input on stormwater issues and the stormwater program.	X	X	X	X	X	Stormwater Division Manager
Establish Hotline/Help line	The permittee shall promote and maintain a hotline/helpline for the purpose of public involvement and participation.	X	X	X	X	X	Water Quality Program Manager
Public Review and Comment	The permittee shall make copies of their most recent Stormwater Plans available for public review and comment.	X	X	X	X	X	Water Quality Program Manager
Public Notice	Pursuant to 122.34 the permittee must, at a minimum, comply with State, Tribal and local public notice requirements when implementing a public involvement/ participation program.	X	X	X	X	X	Water Quality Program Manager

4.2 Volunteer Involvement Program

4.2.1 Target Audiences

Public involvement is essential for ensuring the success of the overall stormwater management program. CMSWS strives to reach out and provide opportunities to a broad range of audiences as it's felt that everyone who wants to be involved should be able to. To that end, efforts to reach more diverse audiences have been expanded through mass media and social media outreach. A variety of volunteer events are held year-round in different locations which helps to draw many different people. "VolunThursday" events were added to draw people who are too busy to volunteer on weekends. Programs such as "Streamside Monitoring and Assessment" were added which are fairly quick and simple ways for people to get involved, further expanding the volunteer base. The following sub-sections discuss the volunteer programs used in the City's overall Public Involvement and Participation Program.

4.2.2 Storm Drain Marking Program

This program enables volunteers to adhere vinyl printed markers to storm drains along streets they select in their neighborhoods. CMSWS provides the decals, adhesive, safety vests and information forms for completion by the groups. Following the completion of storm drain marking activities, the groups submit a report that includes the street names and number of drains marked, information concerning the condition of storm drains, and whether any pollution problems were observed. CMSWS staff records and maps the streets where storm drains are marked and ensures any issues reported receive follow-up investigation. **Table 4-2** shows the data relative to this program for the report period.

4.2.3 Adopt-A-Stream Program

The objective of this program is for volunteers to “adopt” segments of streams and agree to walk them, picking up trash and reporting any pollution problems found along the way. The program not only serves as a public involvement initiative, but it also allows for interaction and observations of the City’s streams by its citizens, which can lead to the identification and elimination of pollution sources. AAS activities are tracked in order to help determine programmatic gaps and to identify where resources should be focused. **Table 4-2** shows the data relative to this program for the report period.

Table 4-2: SDM, AAS, and Big Spring Clean Program Results

Activity	Results
Storm drains marked	1,295
Storm Drain Marking volunteers	192
Storm Drain Marking volunteer hours	502
Adopt-A-Stream groups	152
Adopt-A-Stream clean-ups	140
Adopt-A-Stream volunteers	1,811
Adopt-A-Stream volunteer hours	4,388
Adopt-A-Stream miles cleaned	114
Adopt-A-Stream trash collected (tons)	22
Big Spring Clean volunteers	0
Big Spring Clean volunteer hours	0
Big Spring Clean stream miles cleaned	0
Big Spring Clean trash collected (tons)	0
Illicit discharges detected through these programs ¹ .	3

1. This data also included in the total Illicit Discharges data shown in Table 5-15.

4.2.4 The Big Spring Clean

The Big Spring Clean is a one-day annual event promoted by CMSWS and the local organization Keep Mecklenburg Beautiful. The event is held on a selected Saturday morning during the spring season and typically provides seven to nine locations where citizens can go to remove trash from local streams. These locations are conveniently situated at greenway trailheads with ample parking and staffed by CMSWS to provide the volunteers with supplies, drinks and snacks. CMSWS coordinates the logistics during this event and collects statistics such as number of volunteers participating, volunteer hours, and the amount of trash removed at each location. **Table 4-2** shows the data relative to this program for the report period for local waterways at various locations throughout the City. This event was cancelled for FY2021 due to COVID-19 restrictions.

4.2.5 Volunteer Monitoring

The Volunteer Monitoring Program uses a Visual Assessment and Snapshot Assessment methodology. Visual assessment includes volunteers who are trained in workshops about surface water quality, common stream pollutants, and how to identify them. Trained individuals then select a stream site from among a list and agree to send in qualitative, visual assessment

forms every month for their assigned sites. Snapshot Assessment is available to all citizens without having to attend a workshop. Three signs have been posted along stream greenways that have a number for people to text a picture and report the condition of the stream. Staff investigate any problems reported through these programs.

In addition, other volunteer monitoring programs including stream chemical monitoring and macroinvertebrate monitoring continues. Due to weekend workshops to recruit volunteers being resource-intensive and not well-attended, staff now advertises the program and trains volunteer groups upon request. These programs tend to be most popular among school groups. **Table 4-3** shows the data relative to this program for the report period.

4.2.6 Second Saturday Volunteer Events

The “Second Saturday” events take place usually on the second Saturday of every month and run typically from 9 am to 12 noon at different locations that are selected based on clean-up or maintenance needs. The events rotate between stream cleanups, tree maintenance, and storm drain marking. To make it easy for citizens to participate, registration is not required, and the location of each event is made known to the public the month prior to each event. **Table 4-3** shows the data relative to this program for the report period.

4.2.7 Tree Planting Program

The City and CMSWS maintain various tree planting programs where citizens can volunteer to plant and maintain trees on select public property and project sites. This effort helps to stabilize soil and reduce stormwater runoff and pollution. **Table 4-3** shows the data relative to this program for the report period.

4.2.8 Adopt-A-Street Program

The City’s Keep Charlotte Beautiful program maintains an Adopt-A-Street program where citizens can volunteer to adopt a section of roadway to remove trash and litter. This effort helps to keep trash from entering the storm drain system and streams. **Table 4-3** shows the data relative to this program for the report period.

4.3 Public Involvement Mechanism

The City of Charlotte and Mecklenburg County maintain a citizen Storm Water Advisory Committee (SWAC).

SWAC serves as the City’s stormwater management citizen advisory panel for involving the public in the development and implementation of the permit program. The SWAC reviews:

- Capital and operational programs;
- Appeals;
- Stormwater program policies;

- Long-range plans; and
- Budgets.

The committee also adjudicates appeals for erosion control violations, pollution control violations, service charges, and fee credits and adjustments. **Table 4-3** shows the data relative to this program for the report period.

Table 4-3: Public Involvement Program Results

Activity	Results
Volunteer Monitoring participants	313
Volunteer Monitoring participant hours	45
Volunteer Monitoring samples collected	84
Volunteer Monitoring visual observations made	61
Illicit discharges detected through this program ¹	10
Second Saturday total events	11
Second Saturday volunteers	254
Second Saturday volunteer hours	762
Second Saturday Event – Stream Clean-ups	3
Second Saturday Event trash collected (tons)	3
Second Saturday Event – Tree Maintenance	5
Second Saturday Event – Storm Drain Marking	4
Tree planting volunteers	87
Tree planting volunteer hours	261
Trees planted by volunteers	245
Adopt-A-Street volunteers	2,528
Adopt-A-Street volunteer hours	4,789
Adopt-A-Street miles cleaned	402
Adopt-A-Street bags of trash collected	2,422
Adopt-A-Street bags of recyclables collected	262
SWAC meetings	11
Attendees at SWAC meetings	73

1. This data also included in the total Illicit Discharges data shown in Table 5-15.

4.4 Public Reporting Mechanisms

The City, in cooperation with Mecklenburg County, operates a joint customer service hotline to receive information about a variety of concerns. Citizens can call 311 to report pollution, flooding, and blockages to the drainage system as well as request other City/County services. The 311-call center is staffed to receive calls Monday through Friday from 7 am to 7 pm. Citizens can also submit requests for service to 311 at any time by using the CLT+ app or by going online to the “Report a Problem” section of the website. All personnel from the customer service group receive training on stormwater issues and pollution to ensure calls are directed to appropriate personnel and handled in a timely manner. The training manual for 311 staff is reviewed and updated periodically to ensure information and resources are accurate.

4.5 Public Review and Comment Opportunities

The City provides opportunities for public review and comment on the implementation of its NPDES MS4 permit and SWMP plan through website information.

4.6 Public Notice

During the report period the City issued no public notices relevant to the NPDES MS4 program.

4.7 Measurable Goals/Planned Activities for Future Program Years

Table 4-4 describes the various Public Involvement and Participation Program BMPs and the Measurable Goals and Planned Activities for Future Program Years for each BMP by permit term year.

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Table 4-4: BMP Measurable Goals for the Public Involvement and Participation Program.

BMP	BMP Description	Measurable Goals (by permit term year)				
		1	2	3	4	5 ⁺
Volunteer community involvement program	The permittee shall include and promote volunteer opportunities designed to promote ongoing citizen participation.	Continue to maintain a public involvement and participation program that outlines campaigns and tools to encourage public involvement. (On-going, years 1 – 5 ⁺)				
Establish a Mechanism for Public involvement	The permittee shall provide and promote a mechanism for public involvement that provides for input on stormwater issues and the stormwater program.	Maintain the Stormwater Advisory Committee. (On-going, years 1 – 5 ⁺)				
Establish Hotline/Help line	The permittee shall promote and maintain a hotline/helpline for the purpose of public involvement and participation.	Maintain a hotline that receives information from the public 24 hours a day. (On-going, years 1 – 5 ⁺)				
Public Review and Comment	The permittee shall make copies of their most recent Stormwater Plans available for public review and comment.	Maintain an informational website which includes the SWMP available for review and comment. (On-going, years 1 – 5 ⁺)				
Public Notice	Pursuant to 122.34 the permittee must, at a minimum, comply with State, Tribal and local public notice requirements when implementing a public involvement/ participation program.	Comply with State and local public notice requirements when making major changes to the stormwater program and/or applying for permit renewals. (On-going, as needed)				

4.8 Program Assessment

The measurable goals in Table 4-4 for the Public Involvement and Participation Program were successfully accomplished during the annual report period. Information in Section 4 provides more detailed information about implementation efforts. **Table 4-5** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 4-5: Program Summary

PUBLIC INVOLVEMENT PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
Total Volunteers	3,859	2,648	2,657			
Total Volunteer hours	16,019	5,348	5,958			
Total miles cleaned (linear miles)	612	114	114			
Total trash collected (tons)	72	56	25			
SWAC meetings	9	8	11			
Attendees at SWAC meetings	167	158	73			

Does not include Adopt-a-Street program data which is shown separately in Table 4.3

The City’s Public Involvement and Participation Program provides a combination of activities that allows residents to be involved in the City’s stormwater management program and the opportunity to comment on components of the City’s plan to meet NPDES MS4 permit requirements. The following provides an overview of the program’s effectiveness:

Storm Drain Marking Program:

With evolving COVID-19 protocols related to gatherings and events, CMSWS continued to promote the program via social media. The program was promoted as an activity that could be done within a quarantining family unit and allowed for social distancing. The program was successful in fiscal year 2021 with close to 1,300 storm drains marked and over 500 volunteer hours.

Adopt-A-Stream Program:

The number of Adopt-A-Stream volunteers increased slightly. One-time stream clean-ups are becoming more popular with groups versus signing up to conduct two clean-ups per year, which is a requirement for adopting a stream segment.

Big Spring Clean:

The Big Spring Clean event was unable to be held due to COVID-19 restrictions. CMSWS plans to partner with other organizations for a large cleanup event in the fall.

Volunteer Monitoring Program:

The Volunteer Monitoring Program was modified due to COVID-19 protocols and virtual training was created. Volunteer Monitoring is now offered as an activity that can be completed during a stream cleanup in hopes of engaging more volunteers in the program. This is an example of continued program evaluation, creative thinking, and adaptation. When in-person

training of groups wasn't feasible or otherwise resource-intensive and not very popular, staff found new and easier ways to engage volunteers in monitoring streams.

Public Involvement Strategy:

The purpose of the Public Involvement program is to provide an opportunity for citizens to get involved in activities aimed at protecting and improving surface water quality. The City's various volunteer programs are promoted via traditional media such as television and radio, digital media and streaming platforms and on social media platforms. Staff meets quarterly to communicate about volunteer participation and to determine changes that need to take place in order to continue to be successful.

SWAC meetings:

Meeting frequency and participation continues to be maintained in a virtual format. These meetings continue to be a highly effective method for involving the public in policy decisions related to the overall stormwater program.

Public Hotline/ Helpline: The 311-hotline continued to be a successful tool for allowing the public to report surface water and stormwater pollution problems.

Section 5: Illicit Discharge Detection and Elimination (IDDE) Program

During the annual report period, staff implemented the Illicit Discharge Detection and Elimination ("IDDE") program to identify and eliminate sources of pollution to the MS4 per the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measures of success;
- Future goals and planned activities; and
- Program assessment.

5.1 BMP Summary Table

Table 5-1 provides information concerning the BMPs implemented to fulfill the IDDE Program requirements.

Table 5-1: BMP Summary Table for the Illicit Discharge Detection and Elimination Program.

BMP	BMP Description	Schedule (years)					Responsible Position
		1	2	3	4	5	
Maintain appropriate legal authorities	Maintain adequate ordinances or other legal authorities to prohibit illicit connections and discharges and enforce the approved IDDE Program.	X	X	X	X	X	Water Quality Program Manager
Maintain a Storm Sewer System Base Map	The permittee shall maintain a current map showing major outfalls and receiving streams.	X	X	X	X	X	Water Quality Program Manager

Inspection / detection program to detect dry weather flows at MS4 outfalls	Maintain written procedures and/or Standard Operating Procedures (SOPs) for detecting and tracing the sources of illicit discharges and for removing the sources or reporting the sources to the State to be properly permitted. Written procedures and/or SOPs shall specify a timeframe for monitoring and how many outfalls and the areas that are to be targeted for inspections.	X	X	X	X	X	Water Quality Program Manager
Employee Training	Conduct training for appropriate municipal staff on detecting and reporting illicit connections and discharges.	X	X	X	X	X	Water Quality Program Manager
Maintain a public reporting mechanism	Maintain and publicize reporting mechanism for the public to report illicit connections and discharges. Establish citizen request response procedures.	X	X	X	X	X	Water Quality Program Manager
Documentation	The permittee shall document the date of investigations, any enforcement action(s) or remediation that occurred.	X	X	X	X	X	Water Quality Program Manager

5.2 Ordinance Administration and Enforcement

The City adopted its original Stormwater Pollution Control Ordinance (SWPCO) on January 30, 1995 for the initial NPDES MS4 permit term. The ordinance was subsequently updated and amended most recently on May 26, 2020 with the latest revisions effective on July 1, 2020. This ordinance continues to be implemented as part of the NPDES MS4 permit program and SWMP. All procedures and guidelines for proper administration and enforcement of the ordinance are reviewed and updated, as necessary.

SWPCO data has been maintained since the inception of the program in FY1995. Determined violations of the SWPCO result in the issuance of an NOV and additional enforcement measures, such as civil penalty assessment, when deemed necessary.

Tables 5-2 and 5-3 show the data relative to the SWPCO program for the report period.

Table 5-2: SWPCO Program Results

Activity	Results
Total NOVs issued	100
Total Civil penalties issued	7

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Table 5-3: NOVs Issued per Material Category per Month

Material Category	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
Animal waste										1			1
Automotive fluids	1					1		1					3
Chemicals		1						1	2		1		5
Concrete/Mortar	3			1					2		1		7
Diesel fuel						1	1			1		1	4
Food waste/grease/oil	1	1	1	1		2	3	1	1			1	12
Gasoline			1					1					2
HDD slurry											1	1	2
Heating oil													0
Hydraulic oil											1		1
Illicit connection													0
Kerosene													0
Motor oil		1	1		1			1					4
Other-specify													0
Paint		1								1			2
Plaster/Drywall													0
Process water			1						1				2
Pvt. Comm./Indust. SSO				1	2		1		1		1		6
Pvt. Multi-family SSO	3			2		2	1	1	3	2	1	1	16
Pvt. Single-family SSO	2	1		2		2	3	3	1	3	1		18
Sealants													0
Sediment			2				1			1			4
Solvents					1								1
Swimming pool water													0
Trash/Debris		1	1					2			1		5
Washwater									1	1	1		3
Wastewater			1	1									2
Yard waste													0
													0
													0
													0
													0
TOTALS	10	6	8	8	4	8	10	11	12	10	9	4	100

5.3 Stormwater System Inventory and Storm System Base Map

The City collects stormwater system inventory using a Stormwater Inventory Program and a Stream Walk Program.

Stormwater Inventory Program: This program collects data on components of the stormwater system such as catch basins, inlets, pipes, etc. while the stream walk program discussed below collects data on outfalls. All inventory data receives quality assurance/quality control (“QA/QC”) and is converted digitally into GIS.

Stream Walk Program: This program focuses on CMSWS staff walking stream channels to inspect outfalls, identify and collect outfall data, and to identify dry weather flows and other programs along the stream corridor. Stream walks are scheduled in every sub-basin within the City at least one time every five years. All Stream Walk Program data is transferred to the City’s Inventory Program annually.

Table 5-4 shows the data relative to the stormwater system inventory program for the report period.

Table 5-4: Stormwater Inventory Program Results

Activity	Results
Stream walk sub-basins (six sq.mi.) assessed	17
Stream walk stream miles assessed	214
New outfalls identified	213
Existing outfalls QA/QC'd	219
System work zone areas (one sq. mi.) evaluated	104
Square miles evaluated (system inventory watershed)	81.5
Pipe miles inventoried	727
Open drainage miles inventoried	337
Stormwater features inventoried	110,265
Development projects added (system inventory)	63

5.4 Illicit Discharge Detection and Elimination Program

5.4.1 Outfall Inspection and Dry Weather Flow Detection

Each year select sub-basin outfalls are inspected for physical condition, the presence of dry weather flows (DWFs), and illicit discharges. These inspections are primarily conducted during Stream Walks and Hot Spot Investigations. Outfall inspections also occur during service request and field investigations, municipal facility inspections, and industrial facility inspections.

DWFs are sampled for physical parameters (temperature, conductivity, pH, etc.), fecal coliform and total phosphorus. Staff also conducts qualitative observations of DWFs for signs of pollution such as color, odor, clarity, suds, oil sheen, etc. **Table 5-5** shows the data relative to the outfall inspection and DWF detection program for the report period.

Table 5-5: Outfall Inspection and DWF Program Results

Activity	Results
Total outfalls inspected	687
Outfalls inspected during stream walks	432
Outfalls inspected during service requests/field investigations	42
Outfalls inspected during municipal inspections	126
Outfalls inspected during industrial inspections	87
DWFs detected	80
DWFs sampled	7
Fecal Coliform samples collected	9
Total Phosphorus samples collected	9
Fecal Coliform results investigated	1
Illicit discharges detected through this program ¹	6
Municipal SSOs reported to CW	4
Stream blockages detected/reported	39
Severe stream bank erosion areas detected/recorded	23
Other potential issues detected	20

1. This data also included in the total Illicit Discharges data shown in Table 5-15.

5.4.2 Surface Water Quality Monitoring

The two main monitoring programs used to support IDDE efforts are the Fixed Interval and CMANN stream monitoring programs. The Fixed Interval program conducts in-stream monitoring for various chemical and physical parameters on a monthly basis and is discussed further in Section 10. The CMANN program is an automated monitoring network that takes in-stream readings every 60 minutes at select monitoring sites for dissolved oxygen, temperature, pH, conductivity, and turbidity. This parameter data is transferred to a database in real-time using cellular telemetry.

“Watch” and “Action” levels for the monitoring parameters are used as part of the program to determine when follow-up investigations are needed to address potential problems. Exceedance of these levels may trigger a field investigation if deemed appropriate.

5.4.3 Illicit Discharge Elimination Program

The Illicit Discharge Elimination Program (“IDEP”) is a sub-set of the overall IDDE program. This program conducts proactive illicit discharge detection, investigation and outreach activities in areas where data and staff experience indicate the greatest likelihood for the occurrence of illicit discharges and/or poor housekeeping practices. During FY2021, the following activities were conducted:

- Multi-Family Residential Community Inspections
- Business Corridor Runs
- Pet Waste Awareness Campaign
- Inspection of facilities that were previously issued a SWPCO civil penalty

Multi-Family Residential Community Inspections: This activity conducts windshield investigations of privately maintained multi-family residential sewer systems to look for signs of problems with the operation and maintenance of these systems. The multi-family systems are selected based on their sewer overflow history. **Table 5-6** shows the data relative to this program for the report period.

Business Corridor Runs: This activity conducts windshield surveys along streets throughout the City that have a high concentration of commercial businesses where illicit discharges and poor housekeeping practices may potentially be found. **Table 5-6** shows the data relative to this program for the report period.

Pet Waste Awareness Campaign: This effort is maintained with the goal of reducing the amount of improperly disposed pet waste. During FY2021, staff placed small flags and signs beside dog waste deposits in a popular park with messages of the environmental and health risks resulting from improper disposal of pet waste as a method to promote awareness. **Table 5-6** shows the data relative to this program for the report period.

Inspection of Previous SWPCO Penalized Facilities : This program inspects businesses that previously received a SWPCO civil penalty within the past three years. The purpose of these inspections is to verify these facilities are maintaining compliance with the SWPCO.

Table 5-6: IDEP Program Results

Activity	Results
Multi-family community inspections conducted	30
Business corridor inspections conducted	30
Business corridor catch basin inspections conducted	120
Pet waste flagging events	9
Inspections at previous SWPCO civil penalty facilities	25
Illicit discharges detected through this program ¹	4

1. This data also included in the total Illicit Discharges data shown in Table 5-15.

5.4.4 Sanitary Sewer Overflows and Septic System Discharges

CMSWS works with two separate City/County departments to reduce sources of bacteria from municipal system SSOs and private septic systems: Charlotte Water (CW) department and Mecklenburg County Groundwater and Wastewater Services. CMSWS is also working with CLT Water and Mecklenburg County Soil & Water Conservation on a pilot outreach program to address private sewer system SSO issues.

Sanitary Sewer Overflows: CW is the City department responsible for operating the municipal water supply and sanitary sewer systems in the City. CW monitors the causes of SSOs and implements various system programs and maintenance activities to reduce SSO occurrences.

Table 5-7 shows the data relative to these programs for the report period.

The City works to decrease SSOs in several ways, which include:

- System infrastructure inspections and maintenance;
- Lift station inspections and maintenance;
- Increasing system capacity with sewer relief projects;
- Commercial, restaurant, industrial, and multi-family inspections;
- The Flow Free education program; and
- Multi-family residential program.

System infrastructure & lift station inspections, maintenance, and improvement: CW implements a number of infrastructure inspection, maintenance, and improvement programs which are designed to reduce inflow and infiltration and SSOs, including:

- SSO rapid response;
- CCTV sewer line inspections;
- Manhole inspections, maintenance, and replacement;
- Cleaning and root treating sewer lines;
- Sewer line ROW clearing;

- Sewer pipe re-lining;
- Lift station inspections and maintenance; and
- Increasing system capacity with sewer relief projects.

Table 5-7 shows the data relative to this program for the report period.

Table 5-7: Municipal Sanitary Sewer System Program Results*

Activity	Results*
Sewer System SSOs discovered/addressed	152
Sewer system SSO volume (gallons)	127,773
SSOs per 100 system miles	3.41
Sewer system lines inspected via CCTV (miles)	279
Sewer system manholes inspected	22,772
Sewer system lines replaced or repaired (miles)	11.3
Sewer system lines re-lined (miles)	10.1
Sewer system manholes replaced or repaired	160
Sewer system lines cleaned (miles)	941
Sewer system lines treated with root chemicals (miles)	328.5
Sewer system lines ROW cleared for access (miles)	106
Sewer system service connections replaced	229
Sewer system lift-station preventative maintenance tasks	155
Sewer system lines added by sewer relief projects (miles)	6.7

* This data is not included in summary data shown in Table 5-15

Commercial/restaurant/industrial inspections: CW performs the following inspection and enforcement activities to address SSO sources from commercial and industrial business:

- Inspection of grease handling facilities at food service establishments and restaurants;
- Inspection and permitting of industrial pretreatment facilities; and
- Enforcement of the City’s Sewer Use Ordinance including issuance of NOV’s and Notices of Deficiency (NOD) as warranted.

Table 5-8 shows the data relative to this program for the report period.

Flow Free education program: CW implements the following education activities to address SSO sources from commercial and industrial business and residential sources:

- Implementation of the Flow Free - Fats, Oils, and Grease (FOG) education program to provide information on proper disposal of pipe-blocking items through the use of mailers, brochures, and presentations.
- Distribution of door hangers to maintenance personnel and property managers of multi-family communities.
- Implementation of the Pipes Hate Wipes campaign to educate residents about the impact flushable wipes have on the collection system and wastewater treatment plants.

Table 5-8 shows the data relative to this program for the report period.

Table 5-8: Sewer System Inspection and Education Program Results*

Activity	Results*
Food grease/oil handling inspections conducted	3,287
Industrial pretreatment inspections conducted	120
City sewer use ordinance NOVs issued	39
City sewer use ordinance NODs issued	44
FOG mailers issued	1,025
FOG brochures distributed	3,333
FOG presentations conducted	2
Citizens educated at FOG presentations	160

* This data is not included in summary data shown in Table 5-15 and Table 3-11

Multi-Family Residential Program:

The multi-family program includes:

- Maintaining a master list of multi-family communities;
- Compiling a list of 50 priority communities for inspection annually;
- Informational letters sent to priority list of multi-family residential communities;
- Education of multi-family community staff to help them comply with the regulations;
- Provision of sewer system Operation & Maintenance Plan templates and other resources on CMSWS' website to help them comply with regulations;
- Inspection of multi-family communities for problems in their private sanitary sewer systems; and
- Issuance of SWPCO NOVs as necessary.

Table 5-9 shows the data relative to this program for the report period.

Table 5-9: Multi-Family Community Program Results

Activity	Results
Multi-family informational letters issued by CMSWS	50
Multi-family inspections conducted by CMSWS	50
Operation & Maintenance Plans developed	22
Multi-family sewer system problems discovered	14
Illicit discharges detected through this program ¹	0

1. This data also included in the total Illicit Discharges data shown in Table 5-15.

Septic Systems: CMSWS works with Mecklenburg County Groundwater and Wastewater Services (GWWS) each year to monitor discharges from septic systems. The GWWS program conducts the permitting, inspections, education and enforcement activities related to septic systems. CMSWS reviews this information to look for potential impacts on surface waters.

Table 5-10 shows the data relative to this program for the report period.

Table 5-10: Septic System Program Results

Activity	Results
Total failing septic systems discovered	25
Failing septic systems connected to municipal sanitary sewer system	15

Failing septic systems repaired	10
Illicit discharges detected through this program ¹	0

1. This data also included in the total Illicit Discharges data shown in Table 5-15.

5.5 Employee IDDE Training and Education

Employee IDDE Training and Education involves training municipal employees about the detection of illicit connections and discharges, and the various methods for reporting suspected pollution problems. Training varies from year to year and is provided through a combination of the following methods:

- Staff meeting presentations;
- On-site, in-person training sessions;
- On-line training module; and
- Other methods such as online contests, posters, fliers, light box displays, emails, websites, and displays and information at employee gatherings.

During FY2021, staff IDDE training and education was provided through in-person training sessions, an online training module in combination with municipal pollution prevention training, and a contest delivered weekly for four weeks via employee e-newsletter. **Table 5-11** shows the data relative to this program for the report period.

Table 5-11: Employee IDDE Training/Education Program Results

Activity	Results
Total staff trained on IDDE	1,870
Presentations at staff meetings ¹	0
Employees trained at staff meeting presentations ¹	0
On-site training presentations and tailgate training sessions at municipal facilities	43
Employees trained at on-site sessions	500
Facilities assigned on-line training sessions	38
Staff trained via on-line training module	656
Staff trained via other methods	714

1. Presentations by CMSWS staff to groups that are not part of the annual municipal site training effort. Examples include employee contests, displays at employee events, etc. This activity was not conducted during FY2021 due to COVID-19 precautions.

5.6 Public Reporting Mechanisms

The City, in cooperation with Mecklenburg County, operates a joint customer service hotline to receive information about a variety of concerns. Citizens can call 311 to report pollution, flooding, and blockages to the drainage system as well as request other City/County services. The 311-call center is staffed to receive calls Monday through Friday from 7 am to 7 pm. Citizens can also submit requests for service to 311 at any time by using the CLT+ app or by going online to the “Report a Problem” section of the website. All personnel from the customer service group receive training on stormwater issues and pollution to ensure calls are directed to appropriate personnel and handled in a timely manner.

5.6.1 Public Education and Outreach

The City maintains a public education and outreach program to inform businesses, industries and the public about illicit discharges and improper waste disposal and how they impact the environment. This education and outreach program includes instructions regarding the proper method for reporting illicit discharges. The primary education and outreach mechanisms used are:

- Media campaign (included mass media and social media);
- Website;
- Utility bill inserts;
- Handouts/brochures/environmental notices;
- Public events; and
- In-person education and training sessions.

Commercial Sector Education and Outreach

The City has created best practices guidance documents for many commercial sectors based on problems revealed through data including service requests, illicit discharges, violation notices, and staff observations. The documents are available online and staff provide them to businesses during service requests and inspections. Past guidance documents created include:

- Landscape Maintenance
- Pressure Washers
- Mobile Vehicle Detailers
- Food Service Industry
- Managers of Apartments and Condos
- Asphalt Sealing
- Indoor Cleaning
- Commercial Property Management
- Breweries
- Concrete
- Horizontal Directional Drilling
- Painting
- Swimming Pools and Spas
- Rooftop Work
- Stone Cutting
- Vehicle and Equipment Repair
- Municipal Contractors

During FY2021, staff created a new best practices guidance document for well drilling as it relates to stormwater pollution and updated the flyer for pressure washers. The documents along with a cover letter were mailed to many local and regional businesses engaged in those activities. **Table 5-12** shows the data relative to this program for the report period.

Table 5-12: Commercial Sector Education Program Results

Activity	Results
Well Drilling BMP guidance documents mailed	112
Pressure Washing BMP guidance documents mailed	647

5.7 Service Requests and Documentation

The 311-call center refers calls for stormwater general, structural, and flooding concerns to CSWS while surface water quality (SWQ) concerns are referred to CMSWS-LUESA. Responding to SWQ service requests continues to be one of the most important methods for detecting and eliminating illicit discharges and connections in the City. **Table 5-13** shows the data relative to this program for the report period.

Table 5-13: Service Request Program Results

Activity	Results
Total stormwater service requests received	3,868
SWQ service requests (pollution related)	445
SWQ emergency responses	35

The City utilizes the Cityworks® database platform to maintain electronic files documenting all IDDE activities including service requests. These are tracked from the original call for service, through investigations and applicable enforcement actions, and until final remedial work is completed.

5.8 Measurable Goals/Planned Activities for Future Program Years

Table 5-14 describes the various Illicit Discharge Detection and Elimination program BMPs and the Measurable Goals and Planned Activities for Future Program Years for each BMP by permit term year.

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Table 5-14: BMP Measurable Goals for the Illicit Discharge Detection and Elimination Program.

BMP	BMP Description	Measurable Goals (by permit term year)				
		1	2	3	4	5 ⁺
Maintain appropriate legal authorities	Maintain adequate ordinances or other legal authorities to prohibit illicit connections and discharges and enforce the approved IDDE Program.	Continue administration and enforcement of the Pollution Control Ordinance and IDDE Program. (On-going, years 1 – 5 ⁺)				
Maintain a Storm Sewer System Base Map	The permittee shall maintain a current map showing major outfalls and receiving streams.	Continue to maintain storm sewer map in GIS and update as necessary to show additional outfalls. (On-going, years 1 – 5 ⁺)				
Inspection / detection program to detect dry weather flows at MS4 outfalls	Maintain written procedures and/or Standard Operating Procedures (SOPs) for detecting and tracing the sources of illicit discharges and for removing the sources or reporting the sources to the State to be properly permitted. Written procedures and/or SOPs shall specify a timeframe for monitoring and how many outfalls and the areas that are to be targeted for inspections.	Maintain and update SOPs for detecting and eliminating illicit discharges and performing outfall inspections. Roughly 20% of identified outfalls will be inspected each year, with extra emphasis on hotspot areas. (On-going, years 1 – 5 ⁺)				
Employee Training	Conduct training for appropriate municipal staff on detecting and reporting illicit connections and discharges.	Maintain an employee training program and conduct employee training. (On-going, years 1 – 5 ⁺)				
Maintain a public reporting mechanism	Maintain and publicize reporting mechanism for the public to report illicit connections and discharges. Establish citizen request response procedures.	Maintain the public reporting hotline and publicize through the media outreach campaign. (On-going, years 1 – 5 ⁺)				
Documentation	The permittee shall document the date of investigations, any enforcement action(s) or remediation that occurred.	Continue to maintain IDDE program records and databases to accurately document the activities in the program. (On-going, years 1 – 5 ⁺)				

5.9 Program Assessment

The measurable goals in Table 5-14 for the Illicit Discharge Detection and Elimination Program were successfully accomplished during the annual report period. Information in Section 5 provides more detailed information about implementation efforts. **Table 5-15** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 5-15: Program Summary

IDDE PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
SWPCO NOVs issued	125	124	100			
SWPCO civil penalties issued	11	13	7			
Stream miles assessed	218	196	214			
Outfalls inspected	1,237	802	474			
Illicit discharges detected/corrected	371	336	307			
SWQ Service requests/reported problems	553	605	445			
Municipal employee IDDE onsite training sessions and facilities assigned online module	86	54	81			
Municipal employees trained on IDDE	1,993	1,692	1,870			

Summary:

- Staff continued administration and enforcement of the Stormwater Pollution Control Ordinance and IDDE program. Staff issued 100 NOVs and 7 civil penalties and responded to 445 reports of potential stormwater pollution/illicit discharges;
- Staff continued to maintain and update the GIS map of stormwater system outfalls. During FY2021, 213 new outfalls were identified and added to the GIS map;
- The IDDE Manual and other IDDE-related SOPs were reviewed and updated during FY2021. Following the five-year plan for outfall inspections during stream walks, outfalls along 214 miles of streams were inspected which represents roughly 20% of stream miles draining greater than 50 acres;
- Staff continued its robust employee training program on illicit discharge detection and reporting. Due to COVID-19, instead of being able to conduct some training through onsite presentations by CMSWS staff, training information was provided to knowledgeable supervisors at several facilities who used the information to conduct “tailgate-style” small group training sessions. Other employees were trained using an online training module developed by CMSWS staff. An employee contest using the mascot Stormy the Turtle was also held over four weeks during May 2021. A total of 1,870 employees were trained and educated about IDDE issues;
- The public reporting hotline 311 continued to be maintained as well as an online reporting form and the City’s CLT+ phone app. All of these public reporting mechanisms were publicized through the program’s media outreach campaign, website, and other ways; and

- Staff continued to input all IDDE-related information into the Cityworks application. This includes all service requests (dates, names, follow-up, etc.), notices of violation, penalties, inspections, and other program data. Various other documentation methods are used to record and track program information such as spreadsheets, tables, and Word documents which are stored electronically in appropriately labeled folders.

Section 6: Construction Site Stormwater Runoff Control Program

During the annual report period, the Construction Site Stormwater Runoff Control program conducted site evaluations and enforced the local ordinance per the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measures of success;
- Future goals and planned activities; and
- Program assessment.

6.1 BMP Summary Table

Table 6-1 provides information concerning the BMPs implemented to fulfill the requirements of the Construction Site Stormwater Runoff Control Program. Funding for the BMPs in this section is covered by local land development fees.

Table 6-1: BMP Summary Table for the Construction Site Stormwater Runoff Control Program.

BMP	BMP Description	Schedule (years)					Responsible Position
		1	2	3	4	5	
Erosion and Sediment Control Program	The permittee has a delegated Sediment and Erosion Control Program. As such, to the extent authorized by law, the permittee is responsible for compliance with the Sediment Pollution Control Act of 1973 and Chapter 4 of Title 15A of the North Carolina Administrative Code. The delegated Sediment and Erosion Control Program effectively meets the maximum extent practicable (MEP) standard for Construction Site Runoff Controls by permitting and controlling development activities disturbing one or more acres of land surface and those activities less than one acre that are part of a larger common plan of development as authorized under the Sediment Pollution Control Act of 1973 and Chapter 4 of Title 15A of the North Carolina Administrative Code.	X	X	X	X	X	Land Development Division Manager
Develop requirements for construction site operators	The NCG010000 permit establishes requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste	X	X	X	X	X	Land Development Division Manager

	at the construction site that may cause adverse impacts to water quality, as part of the Permittee's delegated program.						
Public information and reporting	The permittee shall provide and promote a means for the public to notify the appropriate authorities of observed erosion and sedimentation problems. The permittee may implement a plan promoting the existence of the NCDEQ, Division of Land Resources "Stop Mud" hotline to meet the requirements of this paragraph.	X	X	X	X	X	Land Development Division Manager
Plan reviews	Implement construction site plan reviews as part of the Permittee's delegated program. For new development and redevelopment projects to be built within the permittee's planning jurisdiction by entities with eminent domain authority, the permittee shall, to the maximum extent practicable, coordinate the approval of the construction site runoff control with the Division of Land Resources of NCDEQ.	X	X	X	X	X	Land Development Division Manager

6.2 Erosion and Sediment Control Program

The City operates a delegated Sediment and Erosion Control Program under authority granted by the North Carolina Sedimentation Commission. As such, to the extent authorized by law, the City is responsible for compliance with the Sediment Pollution Control Act of 1973 and Chapter 4 of Title 15A of the North Carolina Administrative Code. The "City of Charlotte – Soil Erosion and Sedimentation Control Ordinance (SESCO)," amended and adopted by City Council in 2008, serves as the backbone of the program.

6.2.1 Inspection Procedures

All construction sites that require a preconstruction meeting and an approved plan are logged, filed and placed in the queue for regular inspections. Staff goals are to visit and inspect every logged site utilizing a scheduled inspection process. Sites that generated citizen complaints, had a history of non-compliance, or are in close proximity to a critical area are considered a priority for additional inspections and follow-up. **Table 6-4** shows the data relative to this program for the report period.

6.3 Construction Site Requirements

The program requires that all land disturbing activities comply with ordinance requirements for controlling erosion and sediment on site. As an additional requirement, and in compliance with NPDES regulations, all construction sites one acre or greater must have an approved soil erosion and sediment control plan designed specifically for the site as required by NPDES General Permit NCG010000 for Construction Related Activities.

6.4 Public Information and Reporting

The City’s Erosion Control Program maintains a website to assist with the dissemination of information to the development community and the public. In addition, the City, in cooperation with Mecklenburg County, operates a joint customer service hotline to receive information about a variety of concerns. Citizens can call 311 to report pollution, flooding, and blockages to the drainage system as well as request other City/County services. The 311-call center is staffed to receive calls Monday through Friday from 7 am to 7 pm. Citizens can also submit requests for service to 311 at any time by using the CLT+ app or by going online. The hotline serves as a clearinghouse for general information and ensures that erosion control related issues are directed to appropriate CSWS-LD staff for resolution.

Table 6-4 shows the data relative to this program for the report period.

6.4.1 Education and Training Materials

The City maintains an education and training program for developers, contractors and other interested parties within the region. In a cooperative effort with Mecklenburg County, the City maintains the Charlotte-Mecklenburg Certified Site Inspector (“CMCSI”) training program, which has provided training to many individuals since its inception in 2003. **Table 6-2** shows the data relative to this program for the report period.

In addition to the CMCSI education program, all developers, builders and responsible parties receive handouts and materials at preconstruction meetings and at other times as necessary to explain ordinance requirements, minimum standards and other relevant information for the financially responsible party and/or site operators.

Table 6-2: CMCSI Training Program Results

Activity	Results
Cumulative total persons trained since program inception (FY2003)	6,731
Training sessions conducted	0
Total persons trained	257
Persons attending training sessions	0
Persons trained on-line	257

No in-person training sessions were held during the permit term due to COVID; all training was done online

6.5 Plan Reviews

All land disturbing activities one acre or greater are required to obtain plan approval of the soil erosion and sediment control plan prior to scheduling a preconstruction conference. Erosion control plans submitted by the applicants are reviewed and approved by CSWS-LD erosion control staff.

All CSWS-LD erosion control staff obtain and maintain their status as a Certified Professional in Erosion and Sediment Control (CPESC) which provides accreditation for plan review. Plans are reviewed for suitability of selected measures and to ensure that design parameters and calculations are appropriately utilized and minimum standards are achieved.

6.6 Measurable Goals/Planned Activities for Future Program Years

Table 6-3 describes the various Construction Site Stormwater Runoff Control BMPs and the Measurable Goals and Planned Activities for Future Program Years for each BMP by permit term year.

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Table 6-3: BMP Measurable Goals for the Construction Site Stormwater Runoff Control Program.

BMP	BMP Description	Measurable Goals (by permit term year)				
		1	2	3	4	5 ⁺
Erosion and Sediment Control Program	The permittee has a delegated Sediment and Erosion Control Program. As such, to the extent authorized by law, the permittee is responsible for compliance with the Sediment Pollution Control Act of 1973 and Chapter 4 of Title 15A of the North Carolina Administrative Code. The delegated Sediment and Erosion Control Program effectively meets the maximum extent practicable (MEP) standard for Construction Site Runoff Controls by permitting and controlling development activities disturbing one or more acres of land surface and those activities less than one acre that are part of a larger common plan of development as authorized under the Sediment Pollution Control Act of 1973 and Chapter 4 of Title 15A of the North Carolina Administrative Code.	Continue to implement the delegated Sediment and Erosion Control program and enforce the City ordinance. (On-going, years 1 – 5 ⁺)				
Develop requirements for construction site operators	The NCG010000 permit establishes requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality, as part of the Permittee's delegated program.	Continue requirements for BMPs and waste control through issuance of General Construction Permit NCG010000. (On-going, years 1 – 5 ⁺)				
Public information and reporting	The permittee shall provide and promote a means for the public to notify the appropriate authorities of observed erosion and sedimentation problems. The permittee may implement a plan promoting the existence of the NCDENR, now NCDEQ, Division of Land Resources "Stop Mud" hotline to meet the requirements of this paragraph.	Continue to maintain reporting hotline and website. (On-going, years 1 – 5 ⁺)				
Plan reviews	Implement construction site plan reviews as part of the Permittee's delegated program. For new development and redevelopment projects to be built within the permittee's planning jurisdiction by entities with eminent domain authority, the permittee shall, to the maximum extent practicable, coordinate the approval of the construction site runoff control with the Division of Land Resources of DENR.	Continue plan reviews to ensure program requirements are met. Coordinate with NCDEQ-Division of Energy, Mining, and Land Resources as necessary. (On-going, years 1 – 5 ⁺)				

6.7 Program Assessment

The measurable goals in Table 6-3 for the Construction Site Stormwater Runoff Control Program were successfully accomplished during the annual report period. Information in Section 6 provides more detailed information about implementation efforts. **Table 6-4** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 6-4: Program Summary

CONSTRUCTION SITE RUNOFF PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
SESCO NOVs issued	51	41	35			
SESCO civil penalties issued	60	31	20			
Site inspections conducted	3,513	4,902	5,044			
Service requests/reported problems	500	550	510			
CMCSI training sessions (in-person)	3	2	0			
Persons trained on CMCSI	349	339	257			
Project/site plans reviewed	1,254	1,030	1,293			

Section 7: Post-Construction Stormwater Management Program

During the annual report period, the City conducted implementation of its Post-Construction Stormwater Management program in accordance with the Post-Construction Stormwater Ordinance (“PCSO”) and program administrative manual. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measures of success;
- Future goals and planned activities; and
- Program assessment.

7.1 BMP Summary Table

Table 7-1 provides information concerning the BMPs implemented to fulfill the requirements of the Post-Construction Stormwater Management Program. Funding for the BMPs in this section is covered by local stormwater utility fees and land development fees.

Table 7-1: BMP Summary Table for the Post-Construction Stormwater Management Program.

BMP	BMP Description	Schedule (years)					Responsible Position
		1	2	3	4	5	
Post-Construction Stormwater Management Program	Maintain an ordinance (or similar regulatory mechanism) and program to address stormwater runoff from new development and redevelopment.	X	X	X	X	X	Water Quality Program Manager

Strategies which include BMPs appropriate for the MS4	Maintain strategies that include a combination of structural and/or non-structural BMPs implemented in concurrence with ordinance above. Provide a mechanism to require long-term operation and maintenance of structural BMPs. Require annual inspection reports of permitted structural BMPs performed by a qualified professional. A qualified professional means an individual trained and/or certified in the design, operation, inspection and maintenance aspects of the BMPs being inspected, for example, someone trained and certified by NC State for BMP Inspection & Maintenance.	X	X	X	X	X	Water Quality Program Manager
Deed Restrictions and Protective Covenants	The permittee shall provide mechanisms such as recorded deed restrictions and protective covenants so that development activities maintain the project consistent with approved plans.	X	X	X	X	X	Water Quality Program Manager
Operation and Maintenance Plan	The developer shall provide the permittee with an operation and maintenance plan for the stormwater system, indicating the operation and maintenance actions that shall be taken, specific quantitative criteria used for determining when those actions shall be taken, and who is responsible for those actions. The plan must clearly indicate the steps that shall be taken and who shall be responsible for restoring a stormwater system to design specifications if a failure occurs and must include an acknowledgment by the responsible party. Development must be maintained consistent with the requirements in the approved plans and any modifications to those plans must be approved by the Permittee.	X	X	X	X	X	Water Quality Program Manager
Educational materials and training for developers	Provide educational materials and training for developers. New materials may be developed by the permittee, or the permittee may use materials adopted from other programs and adapted to the permittee's new development and redevelopment program.	X	X	X	X	X	Water Quality Program Manager

7.2 Post-Construction Stormwater Management Program

The City's post-construction program is designed to meet the stormwater management and surface water quality protection requirements of North Carolina Administrative Code at 15A 02H Sections .0126, .0150 - .0154 (NPDES) and at 15A 02H Section .1000 (Stormwater Management) to address post-construction stormwater runoff from new development and applicable redevelopment projects as required by the NPDES MS4 permit program and as

allowable under current State law. The City PCSO covers the entire jurisdictional area (incorporated and ETJ areas) of the City and includes provisions for enforcement remedies and civil penalties to ensure compliance. An administrative manual is maintained to ensure successful implementation of the program and ordinance. **Table 7-3** shows the data relative to this program for the report period.

7.3 Post-Construction BMP Strategies

BMP strategies for the City’s Post-Construction Stormwater Management program consist mainly of structural stormwater control measure(s) (“SCMs”) such as sand filters, wet ponds, wetlands, and bioretention areas. SCMs and design procedures are detailed in a local manual developed by the City and County. SCMs are required on projects that have 24% or greater built upon area as defined by the program. This threshold is reduced to 10-12% built upon area for developments disturbing more than an acre and/or adding more than 20,000 sf of built upon area in sensitive watersheds as defined by the ordinance. In addition, SCMs must be designed to:

- Remove 85% of Total Suspended Solids (“TSS”) for the runoff volume generated from the first 1-inch of rainfall;
- Control the runoff volume from the 1-year – 24-hour storm event; and
- Control the peak flow from the 10 and 25-year storm events for residential and commercial development.

Table 7-3 shows the data relative to this program for the report period.

7.4 Deed Restrictions and Protective Covenants

As part of the PCSO program, the City requires deed restrictions and protective covenants to ensure that development projects remain consistent with approved plans. Stream and buffer boundaries are required to be specified on all surveys and record plats. An operation and maintenance agreement for SCMs is required to be referenced on record plats and recorded in deeds.

7.4.1 Setbacks for Built-Upon Areas

The PCSO program requires a minimum of 30-foot buffers on all perennial and intermittent streams draining less than 50 acres, and incrementally increased required buffer widths up to 100-feet for streams draining 640 acres or more. A special provision in the program requires 200-foot buffers on all perennial streams and 100-foot buffers on all intermittent streams in the Six Mile Creek watershed due to the potential presence of the federally endangered species, Carolina Heelsplitter (*Lasmigona decorata*). These buffers are recorded on record plats as noted in sub-section 7.4.

7.5 Operation and Maintenance Plan

The PCSO program requires an operation and maintenance agreement executed by the responsible party (owner) of each stormwater control measure (SCM). As part of the program, the owner is required to:

- Conduct annual inspections of SCMs;
- Maintain proper records documenting operation and maintenance activities; and
- Submit inspection reports to the City.

CSWS conducts annual inspections of SCMs to ensure proper operation and maintenance and compliance with the PCSO. **Table 7-3** shows the data relative to this program for the report period.

7.6 Education and Training Program

The City implements an education and training program designed to provide developers, designers, and site owners with the information necessary to comply with the City's Post-Construction Stormwater Ordinance. Education and training typically includes information on:

- Overall ordinance requirements;
- Review processes;
- Land development and SCM design requirements;
- Deed restrictions and protective covenants;
- Buffer requirements; and
- Operation, maintenance, and inspection requirements for SCMs.

Education and training are accomplished by providing the following:

- Website information;
- Individual meetings with developers and designers;
- Presentations at public meetings;
- Periodic seminars and training sessions; and
- Training City project design and land development review staff.

Table 7-3 shows the data relative to this program for the report period.

7.7 Measurable Goals/Planned Activities for Future Program Years

Table 7-2 describes the various Post-Construction Stormwater Management Program BMPs and the Measurable Goals and Planned Activities for Future Program Years for each BMP by permit term year.

Table 7-2: BMP Measurable Goals for the Post-Construction Stormwater Management Program.

BMP	BMP Description	Measurable Goals (by permit term year)				
		1	2	3	4	5 ⁺
Post-Construction Stormwater Management Program	Maintain an ordinance (or similar regulatory mechanism) and program to address stormwater runoff from new development and redevelopment.	Maintain the City's Post- Construction Ordinance (PCSO) and implement and enforce the ordinance. (On-going, years 1 – 5 ⁺)				
Strategies which include BMPs appropriate for the MS4	<p>Maintain strategies that include a combination of structural and/or non-structural BMPs implemented in concurrence with (a) above. Provide a mechanism to require long-term operation and maintenance of structural BMPs. Require annual inspection reports of permitted structural BMPs performed by a qualified professional.</p> <p>A qualified professional means an individual trained and/or certified in the design, operation, inspection and maintenance aspects of the BMPs being inspected, for example, someone trained and certified by NC State for BMP Inspection & Maintenance.</p>	Continue PCSO program and ensuring proper BMP operation, maintenance, and annual inspections. (On-going, years 1 – 5 ⁺)				
Deed Restrictions and Protective Covenants	The permittee shall provide mechanisms such as recorded deed restrictions and protective covenants so that development activities maintain the project consistent with approved plans.	Continue to implement Deed Restrictions and Protective Covenants through administration of the PCSO Program. (On-going, years 1 – 5 ⁺)				
Operation and Maintenance Plan	The developer shall provide the permittee with an operation and maintenance plan for the stormwater system, indicating the operation and maintenance actions that shall be taken, specific quantitative criteria used for determining when those actions shall be taken, and who is responsible for those actions. The plan must clearly indicate the steps that shall be taken and who shall be responsible for restoring a stormwater system to design specifications if a failure occurs and must include an acknowledgment by the responsible party. Development must be maintained consistent with the requirements in the approved plans and any modifications to those plans must be approved by the Permittee.	Continue to implement BMP operation, maintenance, and inspection plan and procedures. (On-going, years 1 – 5 ⁺)				
Educational materials and training for developers	Provide educational materials and training for developers. New materials may be developed by the permittee, or the permittee may use materials adopted from other programs and adapted to the permittee's new development and redevelopment program.	Continue to provide and update education/ training tools for developers. (On-going, years 1 – 5 ⁺)				

7.8 Program Assessment

The measurable goals in Table 7-2 for the Post-Construction Stormwater Management Program were successfully accomplished during the annual report period. Information in Section 7 provides more detailed information about implementation efforts. **Table 7-3** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 7-3: Program Summary

POST-CONSTRUCTION PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
PCSO NOV/CARs issued ³ .	948	933	711			
PCSO civil penalties issued	0	4	7			
Site plans reviewed	126	157	162			
SCMs added by development	112	90	144			
SCM inspections conducted ⁴ .	1,600	1,600	1,440			
PCSO training sessions	1	1	1			
Persons trained on PCSO ⁵ .	128	74	124			

3. Includes NOV/CARs and Corrective Action Requests (CARs); and notice of maintenance and report due letters to remind the property owner that a yearly inspection report is due.

4. Includes Post-Construction and Peak Detention SCMs inspected.

5. Number includes only attendees at workshops. Others were educated about aspects of the Post-Construction program through phone calls, website, and other ways.

Section 8: Pollution Prevention/Good Housekeeping Program

During the annual report period, inspection, training, and program development activities were conducted for municipal facilities and operations as part of the Pollution Prevention and Good Housekeeping Program per the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measures of success;
- Future goals and planned activities; and
- Program assessment.

8.1 BMP Summary Table

Table 8-1 provides information concerning the BMPs implemented to fulfill the requirements of the Pollution Prevention & Good Housekeeping Program.

Table 8-1: BMP Summary Table for the Pollution Prevention/Good Housekeeping Program.

BMP	BMP Description	Schedule (years)					Responsible Position
		1	2	3	4	5	
Operation and maintenance program for municipal facilities and operations.	Maintain and implement an operation and maintenance program for municipal facilities owned and operated by the permittee that have been determined by the permittee to have significant potential for generating polluted stormwater runoff that has the ultimate goal of preventing or reducing pollutant runoff.	X	X	X	X	X	Water Quality Program Manager
Site Pollution Prevention Plans for municipal facilities and operations.	Maintain and implement Site Pollution Prevention Plans for municipal facilities owned and operated by the permittee that have been determined by the permittee to have significant potential for generating polluted stormwater runoff that has the ultimate goal of preventing or reducing pollutant runoff.	X	X	X	X	X	Water Quality Program Manager
Inspection and evaluation of municipal facilities and operations.	Maintain an inventory of municipal facilities and operations owned and operated by the permittee that have been determined by the permittee to have significant potential for generating polluted stormwater runoff, including the MS4 system and associated structural SCMs, conduct inspections at facilities and operations owned and operated by the permittee for potential sources of polluted runoff, the stormwater controls, and conveyance systems, and evaluate the sources, document deficiencies, plan corrective actions, implement appropriate controls, and document the accomplishment of corrective actions.	X	X	X	X	X	Water Quality Program Manager
Spill Response Procedures municipal facilities and operations.	Maintain spill response procedures for municipal facilities and operations owned and operated by the permittee that have been determined by the permittee to have significant potential for generating polluted stormwater runoff.	X	X	X	X	X	Water Quality Program Manager
Prevent or Minimize Contamination of Stormwater Runoff from all areas used for Vehicle and Equipment Cleaning	Describe measures that prevent or minimize contamination of the stormwater runoff from all areas used for vehicle and equipment cleaning, including fire stations that serve more than three fire trucks and ambulances. Perform all cleaning operations indoors, cover the cleaning operations, ensure wash water drains to the sanitary sewer system, collect stormwater runoff from the cleaning area and providing treatment or recycling, or other equivalent measures. If sanitary sewer is not available to the facility and cleaning operations take place outdoors, the cleaning operations shall take place on grassed or graveled areas to prevent point source discharges of the wash water into the storm drains or surface waters. Where cleaning operations cannot be performed as described above and when operations are performed in the vicinity of a storm drainage	X	X	X	X	X	Water Quality Program Manager

	collection system, the drain is to be covered with a portable drain cover during cleaning activities. Any excess standing water shall be removed and properly handled prior to removing the drain cover. Facilities that serve three or fewer fire trucks and ambulances and that cannot comply with these requirements shall incorporate structural measures during facility renovation.						
Streets, roads, and public parking lots maintenance	The permittee shall evaluate BMPs to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots within the corporate limits. Within 12 months of permit issuance, the permittee must update its Stormwater Plan to include the BMPs selected.	X					Water Quality Program Manager
Streets, roads, and public parking lots maintenance	Within 24 months of permit issuance, the permittee must implement BMPs selected to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots identified by the permittee in the Stormwater Plan.		X	X	X	X	Water Quality Program Manager
Operation and Maintenance (O&M) for municipally-owned or maintained structural SCMs and the storm sewer system (including catch basins, the conveyance system, and structural stormwater controls).	Within 12 months of permit issuance, the permittee shall develop and implement an operation and maintenance program for structural SCMs and the storm sewer system (including catch basins, the conveyance system, and structural stormwater controls).	X	X	X	X	X	Water Quality Program Manager
Staff training	Maintain and implement a training plan that indicates when, how often, who is required to be trained and what they are to be trained on.	X	X	X	X	X	Water Quality Program Manager

8.2 Operation and Maintenance Program

Operation and maintenance of municipal facilities with regards to stormwater is primarily managed through implementation of Stormwater Pollution Prevention Plan(s) (“SPPPs”) and the municipal facility inspection program. CSWS staff continue to work with various departments to improve and refine best management practices to minimize negative impacts to the storm drainage system. This is primarily accomplished through observations in the field and response to reports from concerned residents and internal staff about field operation practices where improvements are needed. Implementation of BMPs occurs through a combination of communications with management, training of field operations staff, and revision of contract requirements.

8.3 Municipal Facility Stormwater Pollution Prevention Plans

SPPPs are developed for all municipal facilities listed in **Table 8-2** regardless of whether or not they are required; however, SWPPPs are not required or developed for fire stations. The SPPPs are reviewed and updated annually with all documentation kept in the SPPPs, including site maps.

Table 8-2: City Facilities within the Pollution Prevention/Good Housekeeping Program.

Municipal Facility	Physical Address
Charlotte-Douglas International Airport	5501 Josh Birmingham Pkwy., Charlotte, NC 28208
CATS Bus Maintenance Operations Facility	3145 S. Tryon St., Charlotte, NC 28217
CATS Transit Maintenance Operations Center	901 N. Davidson St., Charlotte, NC 28202
CATS Transit Center	310 E. Trade St., Charlotte, NC 28202
CATS Light Rail Maintenance Facility – North Yard	1911 North Brevard Street, Charlotte NC 28202
CATS Light Rail Maintenance Facility – South Yard	3305 Pelton St., Charlotte, NC
CDOT - Traffic Engineering Operations Center	3701 Craig Ave., Charlotte, NC 28211
CDOT – Street Maintenance Division - Northwest District	4411 Northpointe Industrial Blvd., Charlotte, NC 28216
CDOT – Street Maintenance Division - Northeast District	6001 General Commerce Dr., Charlotte, NC 28213
CDOT – Street Maintenance Division - Southwest District	4600 Sweden Rd., Charlotte, NC 28273
Charlotte Water Department - Irwin Creek WWTP	4000 Westmont Dr., Charlotte, NC 28217
Charlotte Water Department - Mallard Creek WWTP	12400 Hwy 29 N, Charlotte, NC 28262
Charlotte Water Department - McAlpine Creek WWTP & Zone 3 Water/Wastewater Operations	12701 Lancaster Hwy, Pineville, NC 28134
Charlotte Water Department - McDowell Creek WWTP	4901 Neck Rd., Huntersville, NC 28078
Charlotte Water Department - Sugar Creek WWTP	5301 Closeburn Rd., Charlotte, NC 28210
Charlotte Water Department - Franklin WTP	5200 Brookshire Blvd, Charlotte, NC 28216
Charlotte Water Department - Lee S Dukes WTP	7980 Babe Stillwell Rd., Huntersville, NC 28078
Charlotte Water Department - Vest WTP	820 Beatties Ford Rd., Charlotte, NC 28216
Charlotte Water Department – Zone 1 Water/Wastewater Field Operations	11609 Hord Dr., Huntersville, NC 28078
Charlotte Water Department – Zone 2 Water/Wastewater Field Operations	5730 General Commerce Dr., Charlotte, NC 28213
Charlotte Water Department – Zone 4 Water/Wastewater Field Operations	4100 W. Tyvola Rd., Charlotte, NC 28208
Charlotte Water Department – Catawba Pump Station	12548 Pump Station Rd., Charlotte, NC 28216
General Services - Heavy Equipment Shop	4600 Sweden Rd., Charlotte, NC 28273
General Services - Heavy Truck Shop / Central Yard Truck Wash	829 Louise Ave., Charlotte, NC 28204
General Services - Light Vehicle Shop	1031 Atando Ave., Charlotte, NC 28216

General Services - Small Engine Repair Shop	701 Tuckaseegee Rd., Charlotte, NC 28208
General Services - 12 th Street Vehicle Garage	900 W 12th St, Charlotte, NC 28206
CFD - Fire Logistics	1501 N. Graham St., Charlotte, NC 28206
CMPD - Animal Control Shelter	8315 Byrum Dr., Charlotte, NC 28217
CMPD - Police and Fire Training Academy	1770 Shopton Rd., Charlotte, NC 28217
Solid Waste Services - Street Sweeper Facility & Sanitation Packer Lot	829 Louise Ave., Charlotte, NC 28204
Landscape Management Operations	701 Tuckaseegee Rd., Charlotte, NC 28208

8.4 Municipal Facility Inventory and Site Inspections

All parcels of land owned or operated by the City continue to be examined to determine whether they should be included in the Municipal Facilities Inventory within the Pollution Prevention/Good Housekeeping Program. A standard administrative procedure (“SAP”) is followed when evaluating parcels for this inventory. Once included in the inventory, applicable facilities receive:

- Preparation and implementation of a SPPP;
- Regular inspections; and
- Annual employee training.

Table 8-3 shows the data relative to this program for the report period.

Table 8-3: Municipal Facility Program Results

Activity	Results
New City owned parcels reviewed for inventory	12
Municipal facility inspections conducted ¹ .	53
SPPP reviews conducted	33
Spill Prevention & Response Plan reviews conducted	33
SWPPP deficiencies noted	5
O & M improvement recommendations made to municipal facilities	91
Municipal operation program evaluations conducted	1
Illicit discharges detected through the municipal facility inspection program ² .	4

1. This number includes 20 fire stations which are inspected once every 5 years. Fire stations do not have individual SPPPs.

2. This data also included in the total Illicit Discharges data shown in Table 5-15.

8.4.1 NPDES Stormwater Permitted Municipal Facilities Review

Twelve of the 33 municipal facilities discussed in sub-section 8.3 above have their own NPDES stormwater permits (*Note: The airport’s permit is a combined stormwater/wastewater individual permit). **Table 8-4** shows these facilities.

Table 8-4: Municipal Facilities with NPDES Stormwater Permits

Municipal Operation	Permit Number	Certificate of Permit Coverage Number	Address
CATS Transit Maintenance Operations Center	NCG080000	NCG080029	901 N. Davidson Street
CATS Bus Maintenance Operations Facility	NCG080000	NCG080710	3145 S. Tryon Street
Heavy Truck Shop, Truck Wash & Street Sweeper Yard	NCG080000	NCG080822	829 Louise Avenue
Heavy Equipment Shop	NCG080000	NCG080840	4600 Sweden Road
Light Vehicle Maintenance Shop	NCG080000	NCG080879	1031 Atando Avenue
12 th Street Fleet Maintenance	NCG080000	NCG080063	900 West 12 th Street
Charlotte-Douglas International Airport*	NC0083887	Not applicable	5501 Josh Birmingham Parkway
Irwin Creek WWTP	NCG110000	NCG110008	4000 Westmont Drive
Mallard Creek WWTP	NCG110000	NCG110114	12400 Highway 29 North
McAlpine Creek WWTP	NCG110000	NCG110010	12701 Lancaster Hwy
McDowell Creek WWTP	NCG110000	NCG110011	4901 Neck Road
Sugar Creek WWTP	NCG110000	NCG110012	5301 Closeburn Road

Annual inspections are conducted by CMSWS staff along with facility management at each facility listed in **Table 8-4**. A second inspection during the year is also conducted by each facility's management staff. Emphasis is placed on elimination of illicit discharges, good housekeeping improvements, and compliance with permit and SPPP requirements, including inspections, monitoring and training. The SPPPs are reviewed annually and updated as necessary.

8.5 Municipal Spill Response Procedures

Spill prevention and response procedures (SPRPs) are maintained for all facilities (and associated field operations) listed in **Table 8-2**. These procedures are incorporated into the facility SPPPs. The procedures and proper implementation of them is evaluated as part of the annual inspections.

8.6 Vehicle and Equipment Cleaning Operations

The City recognizes the negative impacts that municipal vehicle and equipment wash water runoff can have on stormwater and, ultimately, surface waters. Municipal employees wash the majority of vehicles and equipment at commercial or municipal vehicle wash facilities that drain to the sanitary sewer system. Vehicle and equipment washing at municipal facilities continue to be assessed during annual inspections at facilities listed in **Table 8-2**, where applicable.

8.7 Streets, Roads, and Public Parking Lots Maintenance

Streets and parking lots can be a significant source of stormwater pollution and the City implements various BMPs to best address polluted stormwater runoff from these sources, as shown below:

- Street sweeping program;
- Adopt-A-Street program;
- Leaf and yard waste collection program;
- Trash receptacles along downtown streets;
- Trash receptacles and litter control activities at Park and Ride parking lots; and
- Public education to address polluted stormwater runoff from municipally-owned streets and public parking lots.

Table 8-5 shows the data relative to this program for the report period.

Table 8-5: Streets/Roads and Parking Maintenance Program Results

Activity	Results*
Streets/roads swept (miles)*	42,870
Streets/roads sweeping debris removed (tons)*	907
Yard waste collected (tons)*	51,054
Adopt-A-Street miles cleaned ⁶	402
Adopt-A-Street bags of trash collected ⁶	2,422
Adopt-A-Street bags of recyclables collected ⁶	262

* This data not included in summary data shown in Table 4-5

6. This data also shown in Table 4-3.

In addition, to address spills that may occur on municipal streets and in other areas as related to the overall IDDE program, CMSWS maintains a 24-hour emergency response team that responds to environmental emergencies. Members of the team act in an advisory role to the Charlotte Fire Department (“CFD”) Hazmat Unit. The City also has contracts with two environmental cleanup companies to respond to spills generated at municipal facilities and operations and in cases within city limits where the spiller is unknown.

8.8 Municipal SCMs and MS4 System Operation and Maintenance

The City maintains an inventory of municipal structural SCMs which are inspected for proper operation and maintenance at various frequencies based on the type of SCM. The inventory continues to be updated as new SCMs are constructed. Routine maintenance activities for these SCMs include:

- Mowing;
- Trash removal;
- Woody growth removal;
- Cattail removal; and
- Inlet and outlet clearing.

The City also conducts extensive cleaning and maintenance of the MS4 system which includes, but is not limited to:

- Catch basin cleaning (manually and with vacuum trucks);
- Storm drain top cleaning;
- Curb and gutter cleaning;
- Culvert/channel cleaning;
- Drainage structure installation and repair;
- Ditch reshaping; and
- Erosion control.

Table 8-6 shows the data relative to this program for the report period.

Table 8-6: Stormwater System Maintenance Program Results

Activity	Results
Catch basins top cleaned (surface grates, inlets, etc.)	26,603
Catch basins cleaned (entire catch basin vacuumed out)	824
Stormwater pipelines cleaned (pipe vacuumed out) (feet)	8,395

8.9 Employee Staff Training at Municipal Facilities

Training is conducted for employees at all of the facilities listed in **Table 8-2**. The goal of training is to inform employees of the actions necessary to reduce the discharge of pollutants from their facilities/operations and protect surface water quality. Topics for this training include:

- Description of common pollutants, their sources and surface water quality impacts;
- Description of the actions that each facility should take to reduce discharges of pollutants, with an emphasis on good housekeeping;
- Description of effective spill prevention measures that should be employed at each facility;
- Discussion of typical pollution sources at municipal operations and specific actions that should be taken to eliminate these sources and protect surface water quality;
- Review of the facility SWPPP, where applicable;
- Explanation of the potential negative consequences of failing to control pollutants at facilities; and
- Overview of IDDE Program and how to report observed surface water quality problems.

Table 8-7 shows the data relative to this program for the report period.

Table 8-7: Municipal Facility Employee Training Program Results

Activity	Results
Training sessions conducted (in person)	43
Employees trained at sessions (in person)	500
Employees trained via on-line training module	656

Total employees trained	1,156
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8.10 Measurable Goals/Planned Activities for Future Program Years

Table 8-8 describes the various Pollution Prevention/Good Housekeeping Program BMPs and the Measurable Goals and Planned Activities for Future Program Years for each BMP by permit term year.

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Table 8-8: BMP Measurable Goals for the Pollution Prevention/Good Housekeeping Program.

BMP	BMP Description	Measurable Goals (by permit term year)				
		1	2	3	4	5 ⁺
Operation and maintenance program for municipal facilities and operations.	Maintain and implement an operation and maintenance program for municipal facilities owned and operated by the permittee that have been determined by the permittee to have significant potential for generating polluted stormwater runoff that has the ultimate goal of preventing or reducing pollutant runoff.	Review and update Operation and Maintenance programs as necessary. Continue operation and maintenance activities per established procedures. (On-going, years 1 – 5 ⁺)				
Site Pollution Prevention Plans for municipal facilities and operations.	Maintain and implement Site Pollution Prevention Plans for municipal facilities owned and operated by the permittee that have been determined by the permittee to have significant potential for generating polluted stormwater runoff that has the ultimate goal of preventing or reducing pollutant runoff.	Review and update facility SWPPPs as necessary. Continue implementation of SWPPPs. (On-going, years 1 – 5 ⁺)				
Inspection and evaluation of municipal facilities and operations.	Maintain an inventory of municipal facilities and operations owned and operated by the permittee that have been determined by the permittee to have significant potential for generating polluted stormwater runoff, including the MS4 system and associated structural SCMs, conduct inspections at facilities and operations owned and operated by the permittee for potential sources of polluted runoff, the stormwater controls, and conveyance systems, and evaluate the sources, document deficiencies, plan corrective actions, implement appropriate controls, and document the accomplishment of corrective actions.	Review and update inventory of facilities for inspection. Conduct inspections of applicable facilities and make corrective actions where necessary. (On-going, years 1 – 5 ⁺)				
Spill Response Procedures municipal facilities and operations.	Maintain spill response procedures for municipal facilities and operations owned and operated by the permittee that have been determined by the permittee to have significant potential for generating polluted stormwater runoff.	Review facility spill response procedures and update as necessary. Continue implementation of procedures. (On-going, years 1 – 5 ⁺)				
Prevent or Minimize Contamination of Stormwater Runoff from all areas used for Vehicle and Equipment Cleaning	Describe measures that prevent or minimize contamination of the stormwater runoff from all areas used for vehicle and equipment cleaning, including fire stations that serve more than three fire trucks and ambulances. Perform all cleaning operations indoors, cover the cleaning operations, ensure wash water drains to the sanitary sewer system, collect stormwater runoff from the cleaning area and providing treatment or recycling, or other equivalent measures. If sanitary sewer is not available to the facility and cleaning operations take place outdoors, the cleaning operations shall take place on grassed or graveled areas to prevent point source discharges of the wash water into the storm drains or surface waters.	Review procedures for vehicle and equipment cleaning operations and update as necessary. Ensure that corrective actions are implemented where operations are found to not be in compliance with the permit. (On-going, years 1 – 5 ⁺)				

	<p>Where cleaning operations cannot be performed as described above and when operations are performed in the vicinity of a storm drainage collection system, the drain is to be covered with a portable drain cover during cleaning activities. Any excess standing water shall be removed and properly handled prior to removing the drain cover.</p> <p>Facilities that serve three or fewer fire trucks and ambulances and that cannot comply with these requirements shall incorporate structural measures during facility renovation.</p>			
Streets, roads, and public parking lots maintenance	The permittee shall evaluate BMPs to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots within the corporate limits. Within 12 months of permit issuance, the permittee must update its Stormwater Plan to include the BMPs selected.	Evaluate various types of BMPs that would best address polluted stormwater runoff from municipally-owned streets and parking lots and select BMPs based on the evaluation by Feb 28, 2014.	None (years 2 – 5 ⁺)	
Streets, roads, and public parking lots maintenance	Within 24 months of permit issuance, the permittee must implement BMPs selected to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots identified by the permittee in the Stormwater Plan.	None	Implement BMPs selected from year one evaluation by Feb 28, 2015.	Continue to implement selected BMPs. (On-going, years 3 – 5 ⁺)
Operation and Maintenance (O&M) for municipally-owned or maintained structural SCMs and the storm sewer system (including catch basins, the conveyance system, and structural stormwater controls).	Within 12 months of permit issuance, the permittee shall develop and implement an operation and maintenance program for structural SCMs and the storm sewer system (including catch basins, the conveyance system, and structural stormwater controls).	Continue to implement structural SCM operation, maintenance, and inspection program. Continue operation and maintenance program for the MS4 system. (On-going, years 1 – 5 ⁺)		
Staff training	Maintain and implement a training plan that indicates when, how often, who is required to be trained and what they are to be trained on.	For facilities included in the municipal facility inspection program, conduct staff training on SWPPPs and Spill Response Procedures according to the Training Plan. (On-going, years 1 – 5 ⁺)		

8.11 Program Assessment

The measurable goals in Table 8-8 for the Prevention and Good Housekeeping Program were successfully accomplished during the annual report period. Information in Section 8 provides more detailed information about implementation efforts. **Table 8-9** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 8-9: Program Summary

MUNICIPAL GOOD HOUSEKEEPING PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
New City-owned parcels reviewed for inventory	35	42	12			
Municipal facilities inspected	32	33	53 ⁷			
Municipal operation program evaluations	17	14	1			
O & M improvement recommendations made	72	78	91			
Municipal facility employee training sessions	86	18	43			
Municipal facility employees trained	1,993	1,008	1,156			

7. FY2021 inspections included 20 municipal fire stations which are only inspected once per permit term

Summary:

- Operation and maintenance activities for municipal facilities continued to be implemented during FY2021. Such activities are included in facility SPPPs, and each of the 33 facility SPPPs were reviewed and updated as part of annual facility inspections and reviews;
- New properties purchased by the City in the previous year were evaluated for activities and potential inclusion in the Municipal Good Housekeeping program. Twelve properties were evaluated. A new vehicle and equipment maintenance facility being constructed was added to the program. Inspections were conducted at 53 facilities during FY2021 which included the 33 facilities conducted every year plus 20 fire stations which are inspected once every 5 years. Inspection reports were issued to facility Managers which pointed out any deficiencies and recommendations. For any issues requiring follow-up, a corrective action documentation sheet was included in the report and facility Managers were directed to conduct remedial activities, fill in the sheet with actions taken and dates completed, and return them to CMSWS staff. A total of 91 deficiencies and recommendations were identified during the inspections;
- Facility spill response procedures are included in facility SPPPs. The procedures were reviewed and updated, as necessary, as part of SPPP reviews during FY2021. Staff continued to maintain contracts with two spill response contractors and utilized their services to clean up discharges as needed;
- Staff inspected vehicle and equipment wash areas as part of facility inspections. Best practices and procedures are documented in facility SPPPs which are reviewed annually. Staff did not identify any issues with vehicle and equipment washing during FY2021;
- City staff continued to implement selected BMPs for public streets and parking lot maintenance;

- City staff continued to conduct inspections and maintenance of City-owned SCMs in accordance with the SOP. During FY2021, a Long-Term Stewardship program supervisor was hired to expand and improve upon long-term maintenance of CSWS stormwater projects and City-owned SCMs; and
- Training about stormwater pollution prevention, good housekeeping, and spill response procedures was provided in various forms to municipal staff to 1,156 employees.

Section 9: Program to Monitor and Control Pollutants in Stormwater Discharges to Municipal Systems

During the annual report period, inspection and monitoring activities were conducted under the Program to Monitor and Control Pollutants in Stormwater Discharges to Municipal Systems per the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measures of success;
- Future goals and planned activities; and
- Program assessment.

9.1 BMP Summary Table

Table 9-1 provides information concerning the BMPs implemented to fulfill the requirements of the Industrial Facilities Program.

Table 9-1: BMP Summary Table for the Program to Monitor and Control Pollutants in Stormwater Discharges to Municipal Systems.

BMP	BMP Description	Schedule (years)					Responsible Position
		1	2	3	4	5	
Maintain an Inventory of Industrial Facilities	Maintain an inventory of permitted hazardous waste treatment, disposal, and recovery facilities, industrial facilities that are subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), industrial facilities identified with an industrial activity permitted to discharge stormwater to the permittee's MS4, or as identified as an illicit discharge under the IDDE Program. For the purposes of this permit, industrial activities shall mean all permitted industrial activities as defined in 40 CFR 122.26.	X	X	X	X	X	Water Quality Program Manager
Inspection Program	Identify priorities and inspection procedures. At a minimum, priority facilities include those identified above in subsection II.H.2.a.	X	X	X	X	X	Water Quality Program Manager

Evaluate Industrial Facilities discharging stormwater to the City's MS4	<p>The Permittee is required to evaluate control measures implemented at permitted hazardous waste treatment, disposal, and recovery facilities, industrial facilities that are subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), industrial facilities identified with an industrial activity permitted to discharge stormwater to the permittee's MS4, or as identified as an illicit discharge under the IDDE Program.</p> <p>For permitted facilities, the municipality shall establish procedures for reporting deficiencies and non-compliance to the permitting agency. Where compliance with an existing industrial stormwater permit does not result in adequate control of pollutants to the MS4, municipality will recommend and document the need for permit modifications or additions to the permit issuing authority.</p> <p>For the purposes of this permit, industrial activities shall mean all permitted industrial activities as defined in 40 CFR 122.26. For the purpose of this permit, the Permittee is authorized to inspect the permitted hazardous waste treatment, disposal, and recovery facilities as an authorized representative of the Director.</p>	X	X	X	X	X	Water Quality Program Manager
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9.2 Industrial Facility Inventory

An inventory of facilities is maintained showing those facilities that discharge to the City's MS4 and have the potential to discharge significant pollutant loads. The inventory is used to select each year's facilities for inspection and monitoring. Facilities included in the inventory fit into one or more of the following categories:

- Hazardous waste TSD facility;
- SARA Title III facility (TRI reporter);
- NPDES Stormwater permitted facility;
- Stormwater No Exposure Certificate facility;
- Industrial Wastewater Pre-Treatment permitted facility; and
- Facilities identified as having an illicit discharge under the IDDE Program.

9.3 Industrial Facilities Inspection Program

The purpose of the Industrial Facilities Inspection program is to evaluate activities at industrial facilities that may impact stormwater discharges and then work with identified problem facilities to reduce stormwater pollution from the facility. Due to a history of stormwater pollution problems found at vehicle maintenance facilities, staff inspect twenty (20) of those facilities

annually as well. A written Prioritization Strategy provides guidance to staff for inspection frequency of different types of industrial facilities based on a facility’s categorization of high, medium, or low priority. An Industrial Facilities Inspection and Monitoring Procedures Manual is also utilized to guide the overall program. **Table 9-2** shows the data relative to this program for the report period.

Table 9-2: Industrial Facility Program Results

Activity	Results
Industrial facility inspections conducted	39
Vehicle maintenance facility inspections conducted	21
Industrial facilities monitored	8
Illicit discharges detected through this program ¹	1
SWPCO NOVs issued ²	2
Notices of Deficiency issued	1

1. This data also included in the total Illicit Discharges data shown in Table 5-15.

2. This data also included in the total NOVs data shown in Table 5-2.

9.3.1 Industrial Facilities Monitoring Program

The purpose of the Industrial Facilities Monitoring Program is to monitor stormwater runoff from select industrial facilities and identify and correct pollution sources related to industrial activities. Once monitoring is completed, a letter summarizing the results is sent to each monitored facility. For facilities with elevated pollutant levels, recommendations are made to improve outdoor operations, housekeeping, material storage practices, and other measures that should result in reduced pollutant runoff. Staff refer to the Industrial Facility Monitoring Follow-up SOP to guide actions following receipt of monitoring results.

Table 9-2 shows the number of facilities monitored during wet weather conditions for the report period.

9.4 Evaluation Measures

The appropriate evaluation measures to reduce polluted discharges to the City’s MS4 are industrial inspections and monitoring. Inspection letters note that the inspection is being conducted to satisfy both State and City NPDES MS4 permit requirements. For permitted facilities, inspection reports note completion of State-issued permit requirements such as annual training, annual SPPP updates, and monitoring, and staff send a copy of the report to NCDEQ. As pollution sources are identified through the inspection and monitoring program, CMSWS works with the facility personnel, and NCDEQ as applicable, to eliminate the pollution sources. When violations of SWPCO prohibitions and other applicable regulations are identified, enforcement measures are implemented either by the City or NCDEQ, as applicable.

9.5 Measurable Goals/Planned Activities for Future Program Years

Table 9-3 describes the various Industrial Facilities Program BMPs and the Measurable Goals and Planned Activities for Future Program Years for each BMP by permit term year.

Table 9-3: BMP Measurable Goals for the Industrial Facilities Program.

BMP	BMP Description	Measurable Goals (by permit term year)				
		1	2	3	4	5 ⁺
Maintain an Inventory of Industrial Facilities	<p>Maintain an inventory of permitted hazardous waste treatment, disposal, and recovery facilities, industrial facilities that are subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), industrial facilities identified with an industrial activity permitted to discharge stormwater to the permittee's MS4, or as identified as an illicit discharge under the IDDE Program.</p> <p>For the purposes of this permit, industrial activities shall mean all permitted industrial activities as defined in 40 CFR 122.26.</p>	Maintain and update the industrial facility inventory as needed. (On-going, years 1 – 5 ⁺)				
Inspection Program	Identify priorities and inspection procedures. At a minimum, priority facilities include those identified above in subsection II.H.2.a.	Review and update, as necessary, current Industrial Inspection and Monitoring Procedures and develop an inspection prioritization strategy. (On-going, years 1 – 5 ⁺)				
Evaluate Industrial Facilities discharging stormwater to the City's MS4	<p>The Permittee is required to evaluate control measures implemented at permitted hazardous waste treatment, disposal, and recovery facilities, industrial facilities that are subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), industrial facilities identified with an industrial activity permitted to discharge stormwater to the permittee's MS4, or as identified as an illicit discharge under the IDDE Program.</p> <p>For permitted facilities, the municipality shall establish procedures for reporting deficiencies and non-compliance to the permitting agency. Where compliance with an existing industrial stormwater permit does not result in adequate control of pollutants to the MS4, municipality will recommend and document the need for permit modifications or additions to the permit issuing authority.</p> <p>For the purposes of this permit, industrial activities shall mean all permitted industrial activities as defined in 40 CFR 122.26. For the purpose of this permit, the Permittee is authorized to inspect the permitted hazardous waste treatment, disposal, and recovery facilities as an authorized representative of the Director.</p>	Conduct inspection activities based on established procedures and prioritization strategy at 50 facilities for years 1 and 2; and 40 facilities in years 3 -5 ⁺ . Conduct stormwater runoff monitoring at 10 facilities for years 1 and 2; and 8 facilities in years 3 -5 ⁺ .				

9.6 Program Assessment

The measurable goals in Table 9-3 for the Industrial Facilities and Monitoring Program were successfully accomplished during the annual report period. Information in Section 9 provides more detailed information about implementation efforts. **Table 9-4** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 9-4: Program Summary

INDUSTRIAL FACILITIES PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
Master industrial inspection inventory sites	514	515	514			
Facilities inspected*	63	62	60			
Facilities monitored	12	9	8			
Notices of Deficiency issued	15	4	1			

*This data is a combination of industrial facilities and vehicle maintenance facilities.

Section 10: Water Quality Assessment and Monitoring Program

During the annual report period, monitoring activities were conducted per the Water Quality Assessment and Monitoring program plan and the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measures of success;
- Future goals and planned activities; and
- Program assessment.

10.1 BMP Summary Table

Table 10-1 provides information concerning the BMPs implemented to fulfill the requirements of the Water Quality Assessment and Monitoring Program.

Table 10-1: BMP Summary Table for the Water Quality Assessment and Monitoring Program.

BMP	BMP Description	Schedule (years)					Responsible Position
		1	2	3	4	5	
Water Quality Assessment and Monitoring Plan	Maintain a Water Quality Assessment and Monitoring Plan. The Plan shall include a schedule for implementing the proposed assessment and monitoring activities.	X	X	X	X	X	Water Quality Program Manager
Water Quality Monitoring	Maintain and implement the Water Quality Assessment and Monitoring Plan submitted to DWQ.	X	X	X	X	X	Water Quality Program Manager

10.2 Water Quality Assessment and Monitoring Plan

The City implements the Water Quality Assessment and Monitoring Plan that specifies the basic surface water quality monitoring program and activities to be performed at specified stream sites within the major watersheds in the City (**Table 10-3**). Monitoring is conducted for chemical and physical parameters listed in **Table 10-2** on a fixed interval monitoring basis.

Table 10-2: Water Quality Monitoring Parameters.

Parameter	Sample Type	Frequency (Minimum)
Fecal Coliform	Grab	Quarterly
E-Coli	Grab	Quarterly
Total Phosphorus	Grab	Quarterly
Nitrite + Nitrate	Grab	Quarterly
Total Kjeldahl Nitrogen	Grab	Quarterly
Ammonia Nitrogen	Grab	Quarterly
Total Suspended Solids	Grab	Quarterly
Turbidity	Grab	Quarterly
Copper	Grab	Quarterly
Zinc	Grab	Quarterly
Chromium	Grab	Quarterly
Lead	Grab	Quarterly
Dissolved Oxygen	In Situ	Quarterly
Temperature	In Situ	Quarterly
Conductivity	In Situ	Quarterly
pH	In Situ	Quarterly

Table 10-3: Description of City of Charlotte Surface Water Quality Monitoring Sites.

Site #	Stream	Location
MY11B	Mallard Creek	Pavilion Blvd Bridge, S. of US Hwy 29
MY12B	Back Creek	Stream location, off of Wentwater Street, near Caldwell Rd.
MY13	Reedy Creek	Reedy Creek Rd. Bridge, S. of Plaza Rd. Ext.
MY7B	McKee Creek	Reedy Creek Rd. Bridge, S. of Harrisburg Rd.
MC14A	Long Creek	Pine Island Dr. at End of Street at Golf Course
MC17	Paw Creek	Hwy 74 Culvert, Between Sam Wilson & Little Rock Rd.
MC22A	Irwin Creek	Westmont Dr. Bridge, at Irwin Creek WWTP
MC27	Sugar Creek	Hwy. 51 Bridge, E. of Downs Rd.
MC38	McAlpine Creek	Sardis Rd. Bridge, Between Sardis Ln. & Sardis Rd. N.
MC40A	Four Mile Creek	Elm Ln. Bridge, S. of Hwy. 51
MC42	McMullen Creek	Sharon View Rd. Bridge, Between Sharon Rd. & Colony Rd.
MC45	McAlpine Creek	McAlpine Creek WWTP
MC47A	Steele Creek	Carowinds Blvd. Culvert, W. of Carowinds Amusement Park
MC49A	Little Sugar Creek	Hwy. 51 Bridge, W. of Carolina Place Mall
MC51	Six Mile Creek	Marvin Rd. Bridge, S. of Ardrey Kell Rd.

10.3 Surface Water Quality Monitoring Implementation

The City conducts the fixed interval monitoring program at the monitoring sites listed in **Table 10-3**. Following completion of monitoring activities at the end of each permit reporting year

(June 30th), monitoring data is assessed to determine whether surface water quality trends are apparent. This can help to gauge the combined effectiveness of NPDES MS4 program efforts. **Table 10-4** shows the data relative to this program for the report period.

Table 10-4: Surface Water Quality Monitoring Program Results

Activity	Results
Stream sites monitored	23
Sampling events	12
Stream samples collected	276
Laboratory sample analyses conducted	3,404
Stream physical measurements conducted (DO, Temp, pH, Cond)	1,104
Illicit discharges detected through this program ¹	0

1. This data also included in the total Illicit Discharges data shown in Table 5-15.

10.4 Water Quality Assessment and Monitoring Plan Revisions

The City has reviewed the basic monitoring program plan and data generated during the report period and proposes no changes to the plan.

10.5 Measurable Goals/Planned Activities for Future Program Years

Table 10-5 describes the Water Quality Assessment and Monitoring Program BMPs and the Measurable Goals and Planned Activities for Future Program Years for each BMP by permit term year.

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Table 10-5: BMP Measurable Goals for the Water Quality Assessment and Monitoring Program.

BMP	BMP Description	Measurable Goals (by permit term year)				
		1	2	3	4	5
Water Quality Assessment and Monitoring Plan	Maintain a Water Quality Assessment and Monitoring Plan. The Plan shall include a schedule for implementing the proposed assessment and monitoring activities.	Maintain the WQ Assessment & Monitoring Plan and update as necessary. (On-going, years 1 – 5 ⁺)				
Water Quality Monitoring	Maintain and implement the Water Quality Assessment and Monitoring Plan submitted to DWQ.	Maintain and implement the monitoring plan and conduct WQ assessment and monitoring activities per the plan. (On-going, years 1 – 5 ⁺)				

10.6 Program Assessment

The measurable goals in Table 10-5 for the Water Quality Assessment and Monitoring Program were successfully accomplished during the annual report period. Information in Section 10 provides more detailed information about implementation efforts. **Table 10-6** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 10-6: Program Summary

SURFACE WATER QUALITY MONITORING PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
Stream sites monitored	23	23	23			
Stream samples collected	276	253	276			
Laboratory sample analyses conducted	3,312	3,036	3,312			
Stream physical measurements (DO, Temp, pH, Cond)	1,104	1,012	1,104			

Section 11: Total Maximum Daily Load (TMDL) Program

The City continued to fulfill the NPDES MS4 permit requirements regarding the TMDL Program by implementing the following BMPs within the six minimum NPDES MS4 permit measures. The BMPs are designed to reduce the TMDL pollutant of concern within the TMDL assigned MS4 NPDES regulated waste load allocation to the maximum extent practicable (MEP) within the impaired water bodies in the City’s jurisdiction that are subject to approved TMDLs. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measures of success;
- Future goals and planned activities; and
- Program assessment.

11.1 BMP Summary Table

Table 11-1 provides information concerning the BMPs implemented to fulfill the Total Maximum Daily Load (TMDL) Program requirements. These BMPs pertain to the City’s existing TMDL watershed plan that was developed under the City’s previous NPDES MS4 permit.

Table 11-1: BMP Summary Table for Total Maximum Daily Load (TMDL) Program.

BMP	BMP Description	Schedule (years)					Responsible Position
		1	2	3	4	5	
Identify, describe and map watershed, outfalls, and streams	Within 24 months the permittee shall prepare a plan that: <ul style="list-style-type: none"> • Identifies the watershed(s) subject to an approved TMDL with an approved Waste Load Allocation (WLAs) assigned to the permittee, • Includes a description of the watershed(s), 	X	X	X	X	X	Water Quality Program Manager

	<ul style="list-style-type: none"> Includes a map of watershed(s) showing streams & outfalls Identifies the locations of currently known major outfalls within its corporate limits with the potential of contributing to the cause(s) of the impairment to the impaired segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments and Includes a schedule to discover and locate other major outfalls within its corporate limits that may be contributing to the cause of the impairment to the impaired stream segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments. 						
Existing measures	<p>Within 24 months the Permittee's plan:</p> <ul style="list-style-type: none"> Shall describe existing measures being implemented by the Permittee designed to achieve the <u>MS4's NPDES WLA</u> and to reduce the TMDL pollutant of concern to the MEP within the watershed to which the TMDL applies; and Provide an explanation as to how those measures are designed to reduce the TMDL pollutant of concern. The Permittee shall continue to implement the existing measures until notified by DWQ. 	X	X	X	X	X	Water Quality Program Manager
Assessment of available monitoring data	Within 24 months the permittee's plan shall include an assessment of available monitoring data. Where long-term data is available, this assessment should include an analysis of the data to show trends.	X	X	X	X	X	Water Quality Program Manager
Monitoring Plan	Within 36 months the permittee shall develop and submit to the Division a Monitoring Plan for the permittee's assigned NPDES regulated WLA as specified in the TMDL. The permittee shall maintain and implement the Monitoring Plan as additional outfalls are identified and as accumulating data may suggest. Following any review and comment by the Division the permittee shall incorporate any necessary changes to monitoring plan and initiate the plan within six months. Modifications to the monitoring plan shall be approved by the Division. Upon request, the requirement to develop a Monitoring Plan may be waived by the Division if the existing and proposed measures are determined to be adequate to achieve the MS4's NPDES WLA to MEP within the watershed to which the TMDL applies.	X	X	X	X	X	Water Quality Program Manager
Additional Measures	<p>Within 36 months the permittee's plan shall:</p> <ul style="list-style-type: none"> Describe additional measures to be implemented by the permittee designed to 	X	X	X	X	X	Water Quality Program Manager

	<p>achieve the permittee’s MS4’s NPDES WLA and to reduce the TMDL pollutant of concern to the MEP within the watershed to which the TMDL applies; and</p> <ul style="list-style-type: none"> • Provide an explanation as to how those measures are designed to achieve the permittee’s MS4’s NPDES regulated WLA to the MEP within the watershed to which the TMDL applies. 						
Implementation Plan	<p>Within 48 months the permittee’s plan shall:</p> <ul style="list-style-type: none"> • Describe the measures to be implemented within the remainder of the permit term designed to achieve the MS4’s NPDES WLA and to reduce the TMDL pollutant of concern to the MEP and • Identify a schedule, subject to DWQ approval, for completing the activities. 	X	X	X	X	X	Water Quality Program Manager
Incremental Success	<p>The permittee’s plan must outline ways to track and report successes designed to achieve the MS4’s NPDES regulated WLA and to reduce the TMDL pollutant of concern to MEP within the watershed to which the TMDL applies.</p>	X	X	X	X	X	Water Quality Program Manager
Reporting	<p>The permittee shall conduct and submit to the Division an annual assessment of the program designed to achieve the MS4’s NPDES WLA and to reduce the TMDL pollutant of concern to the MEP within the watershed to which the TMDL applies. Any monitoring data and information generated from the previous year are to be submitted with each annual report.</p>	X	X	X	X	X	Water Quality Program Manager

11.2 TMDL Watershed Plan

The City maintains a TMDL watershed plan for the applicable identified watersheds that are subject to an approved TMDL within the City’s jurisdiction as defined in Part II, Sec J.1 and J.2 within the City’s current NPDES MS4 permit. The plan utilizes BMPs as outlined in the permit within the six minimum NPDES MS4 permit measures that are designed to reduce the TMDL pollutant of concern within the TMDL assigned MS4 NPDES regulated waste load allocation to the MEP. In addition, per Part II, Sec J.3 within the City’s current NPDES MS4 permit, the plan addresses the pollutant of concern for approved TMDLs that do not assign a waste load allocation for the pollutant of concern to the municipal stormwater system by evaluating strategies and tailoring BMPs within the scope of the six minimum permit measures to address the pollutant of concern to the MEP in the watershed(s) to which the TMDL applies. The plan is available for review on the City’s website:

<https://charlottenc.gov/StormWater/SurfaceWaterQuality/Documents/TMDL%20Watershed%20Plan%20FY2021%20-%20FINAL.pdf>

11.2.1 TMDL Watershed Identification

Currently, there are seven approved TMDLs applicable to multiple streams in the City, some of which also include portions of Mecklenburg County. **Table 11-2** provides information on these TMDLs and affected watersheds. Additional information concerning these TMDLs is provided in the City’s TMDL Watershed Plan referenced in section 11.2.

Table 11-2: City of Charlotte Streams with Approved TMDLs

Receiving Stream Name	WQ Classification	TMDL Approved	TMDL Pollutant of Concern
Irwin Creek	C	February 1996	Dissolved Oxygen
Little Sugar Creek	C	February 1996	Dissolved Oxygen
McAlpine Creek	C	February 1996	Dissolved Oxygen
Lake Wylie	WS-IV, B, CA	February 1996	Chlorophyll-a
Irwin Creek	C	March 2002	Fecal Coliform
Little Sugar Creek	C	March 2002	Fecal Coliform
McAlpine Creek	C	March 2002	Fecal Coliform
Sugar Creek	C	March 2002	Fecal Coliform
McKee Creek	C	August 2003	Fecal Coliform
Irwin Creek	C	February 2005	Turbidity
Little Sugar Creek	C	February 2005	Turbidity
Long Creek	C	February 2005	Turbidity
McAlpine Creek	C	February 2005	Turbidity
Sugar Creek	C	February 2005	Turbidity
Steele Creek	C	May 2007	Fecal Coliform
Statewide	All	October 2012	Mercury

Source: 2021 NCDEQ-Division of Water Resources website:

<https://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/tmdls/draft-and-approved-tmdls#Catawba>

<https://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/tmdls/draft-and-approved-tmdls#Yadkin>

11.2.2 Outfall Identification for TMDL Watersheds

As part of the development of the TMDL watershed plan the City developed an existing outfall inventory for the applicable TMDL watersheds. This inventory is maintained using a GIS coverage to show existing outfalls within the TMDL watersheds that have the potential of contributing to the cause(s) of the impairment to the impaired segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments. Additional information on the outfall inventory is provided in the City’s TMDL Watershed Plan referenced in section 11.2.

11.3 Identification of Existing Measures

As part of the development of the TMDL watershed plan the City identified existing programs and measures which are currently in use within the City’s NPDES MS4 permit and surface water quality monitoring programs that are designed to address the assigned MS4 NPDES regulated waste load allocation (“WLA”) and to reduce the TMDL pollutant of concern to the MEP within the watershed to which the TMDL applies. Additional information on the existing measures is provided in the City’s TMDL Watershed Plan referenced in section 11.2.

11.4 Assessment of Available Monitoring Data

Fixed interval surface water quality data collected from 2006 through 2021 was analyzed for all applicable TMDL watersheds and pollutants of concern in the City and County. These data help to illustrate surface water quality trends in relation to the NC surface water quality standards. The City's current NPDES MS4 permit, effective October 10, 2018, states that the "The permittee is not responsible for attaining water quality standards ("WQS"). The Division expects attaining WQS will only be achieved through reduction from all point and nonpoint source contributors identified in the approved TMDL." It is infeasible to monitor every MS4 stormwater outfall to determine how progress is being made toward achieving MS4 NPDES WLAs; therefore, the City utilizes fixed interval surface water data to investigate surface water quality trends. The data presented below, while illustrating how in-stream surface water quality has changed over time, unfortunately are not able to distinguish MS4 contributions from other point and nonpoint sources that are not under the control of the MS4. Consequently, increases in surface water contaminants observed in the data do not necessarily indicate that MS4 contributions are also increasing.

11.4.1 Fecal Coliform

Data from the six watersheds listed as being subject to fecal coliform TMDLs in **Table 11-2** are discussed in this sub-section. Of the six watersheds listed in **Table 11-2**, a MS4 NPDES WLA was only developed for McKee and Steele Creeks. According to Part II, Section J.3 of the City's NPDES MS4 permit, for approved TMDLs where a MS4 NPDES WLA for the pollutant of concern is not assigned to the municipal stormwater system, the Permittee is still required to "evaluate strategies and tailor BMPs within the scope of the six minimum permit measures to address the pollutant of concern in the watershed(s) to which the TMDL applies." Watersheds with and without MS4 WLAs are discussed in the subsections below.

11.4.1.1 McKee Creek

Fixed interval stream data for fecal coliform was collected at the CMSWS monitoring site MY7B on McKee Creek. From July 2006 through June 2021, a total of 182 samples were collected under the fixed interval monitoring program (**Figure 11-1**). Of these, 57% exceeded the 400 cfu/100mL State standard with 90% confidence. Exceedances tended to be more frequent and more extreme under wet weather influenced sampling conditions (meaning some precipitation within the County in the 72-hour preceding the sampling event); however, exceedances did occur under both ambient and wet weather influenced conditions.

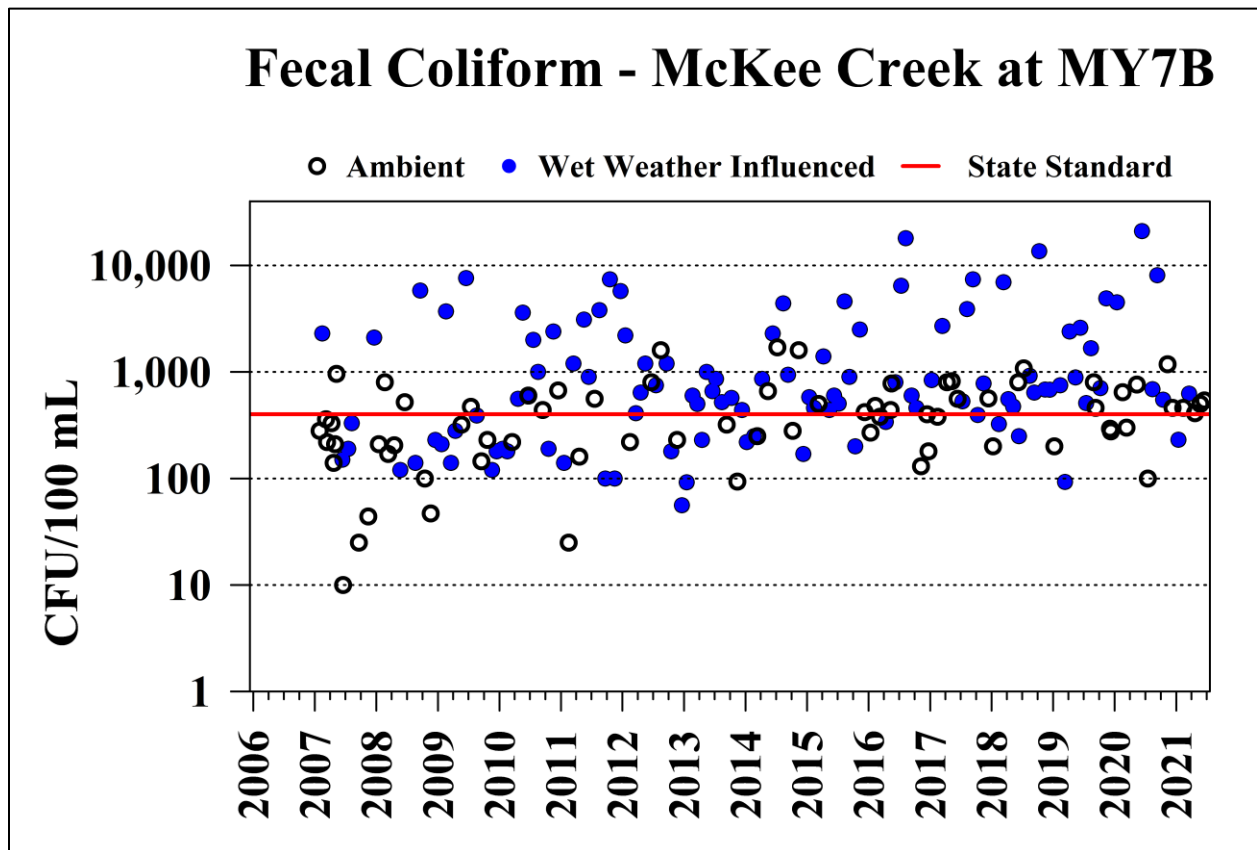


Figure 11-1: McKee Creek –MY7B - Overall Monitoring Data

11.4.1.2 Steele Creek Watershed

Fixed interval stream data for fecal coliform were collected at the CMSWS monitoring site MC47A on Steele Creek. From July 2006 through June 2021, a total of 193 samples were collected under the fixed interval monitoring program (**Figure 11-2**). Of these, 52% exceeded the 400 cfu/100mL State standard with 90% confidence. Exceedances tended to be more frequent and more extreme under wet weather influenced sampling conditions (meaning some precipitation within the County in the 72-hour preceding the sampling event); however, exceedances did occur under both ambient and wet weather influenced conditions.

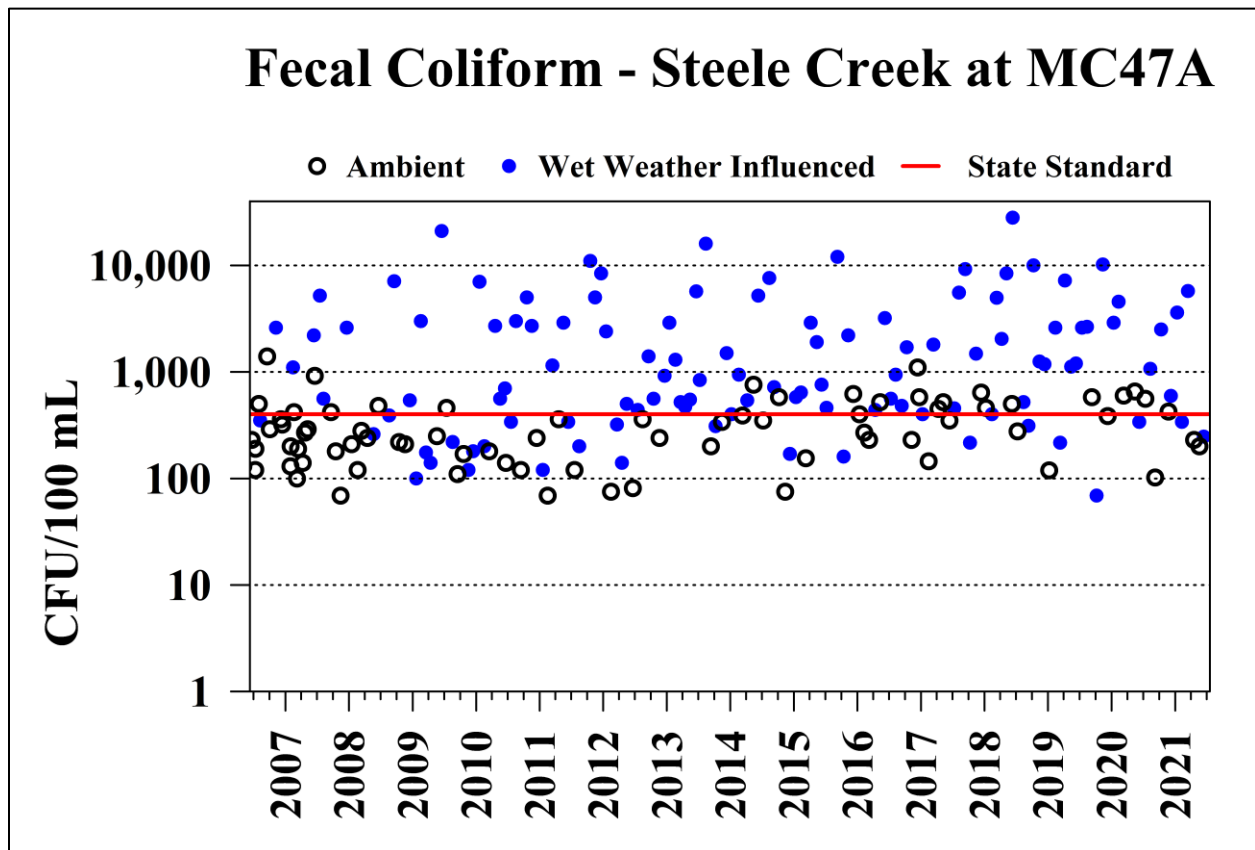


Figure 11-2: Steele Creek –MC47A - Overall Monitoring Data

11.4.1.3 Sugar/Irwin Creek Watershed

There are two fixed interval monitoring locations in the Sugar Creek watershed, MC27 on Sugar Creek southern Mecklenburg County, and MC22A on Irwin Creek just before its confluence with Sugar Creek. An assessment of available watershed and surface water quality data was conducted utilizing fixed interval stream data for fecal coliform collected at these two monitoring locations.

From July 2006 through June 2021, a total of 188 samples were collected at MC27 under the fixed interval monitoring program (**Figure 11-3**). Of these, 42% exceeded the 400 cfu/100mL State standard with 90% confidence. Exceedances tended to be more frequent and more extreme under wet weather influenced sampling conditions (meaning some precipitation within the County in the 72-hour preceding the sampling event); however, exceedances did occur under both ambient and wet weather influenced conditions.

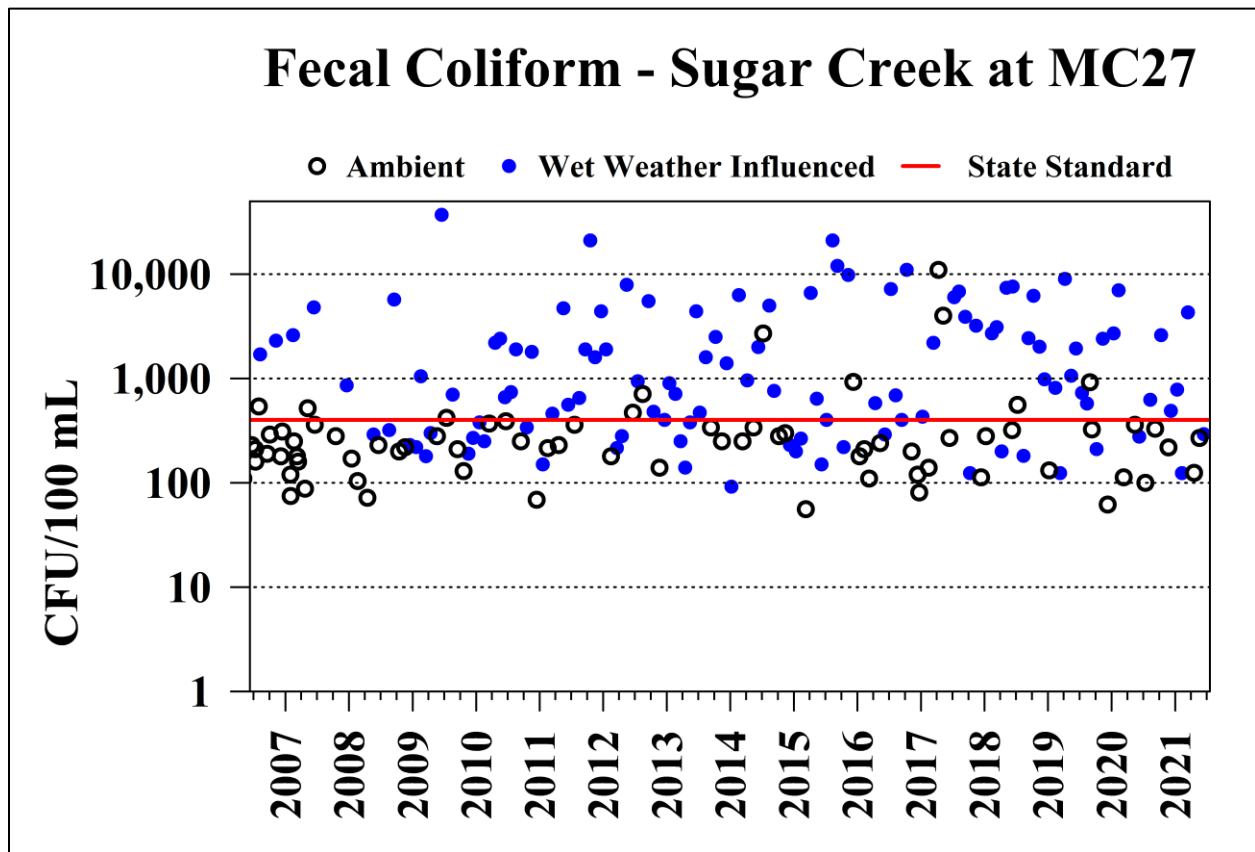


Figure 11-3: Sugar Creek –MC27 - Overall Monitoring Data

During the same period, a total of 184 samples were collected at MC22A under the fixed interval monitoring program (**Figure 11-4**). Of these, 47% exceeded the 400 cfu/100mL State standard with 90% confidence. Exceedances tended to be more frequent and more extreme under wet weather influenced sampling conditions (meaning some precipitation within the County in the 72-hour preceding the sampling event); however, exceedances did occur under both ambient and wet weather influenced conditions.

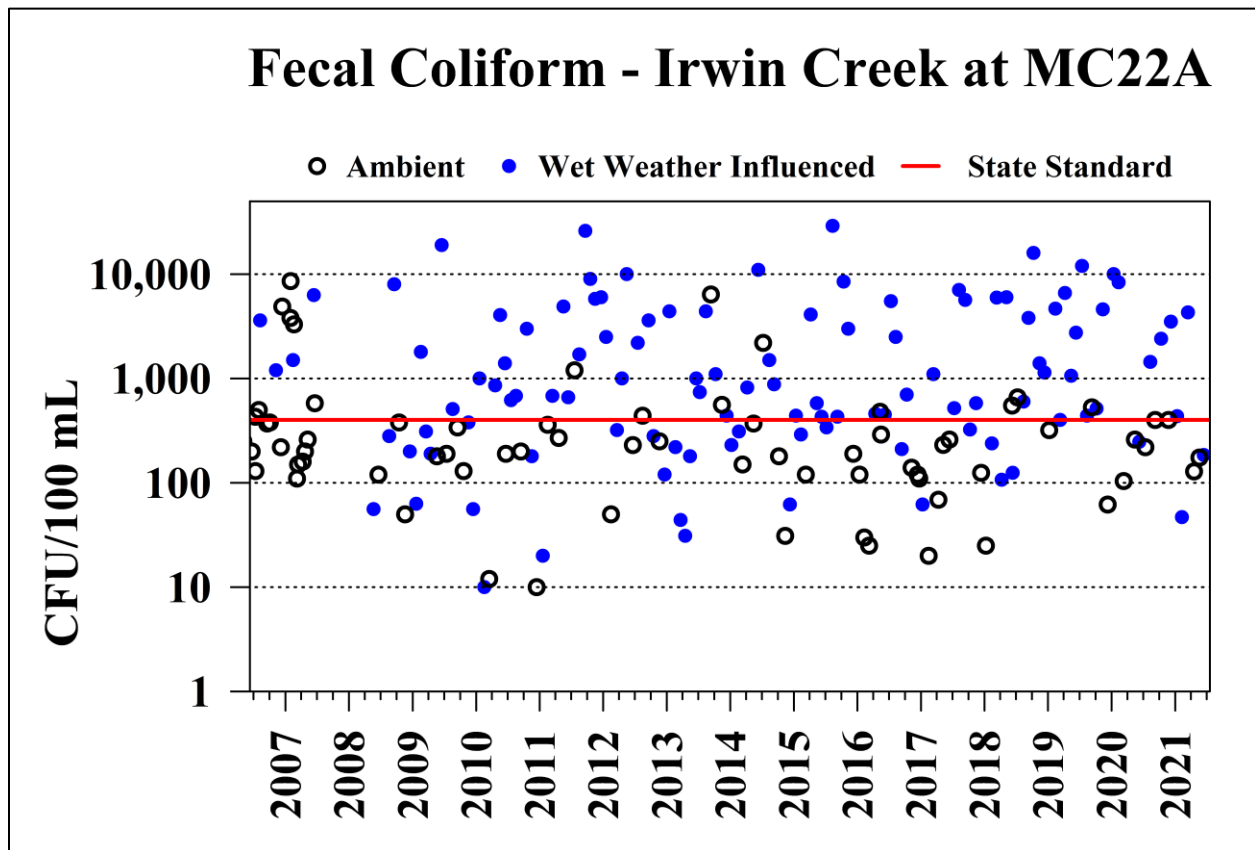


Figure 11-4: Irwin Creek –MC22A - Overall Monitoring Data

11.4.1.4 Little Sugar Creek Watershed

There are two monitoring locations on Little Sugar Creek, MC49A in southern Mecklenburg County just outside the City, and MC29A-1 just downstream of downtown area of the City. An initial assessment of available watershed and surface water quality data was conducted utilizing fixed interval stream data for fecal coliform collected at these two monitoring locations.

From July 2006 through June 2021, a total of 189 samples were collected at MC49A under the fixed interval monitoring program (**Figure 11-5**). Of these, 51% exceeded the 400 cfu/100mL State standard with 90% confidence. Exceedances tended to be more frequent and more extreme under wet weather influenced sampling conditions (meaning some precipitation within the County in the 72-hour preceding the sampling event); however, exceedances did occur under both ambient and wet weather influenced conditions.

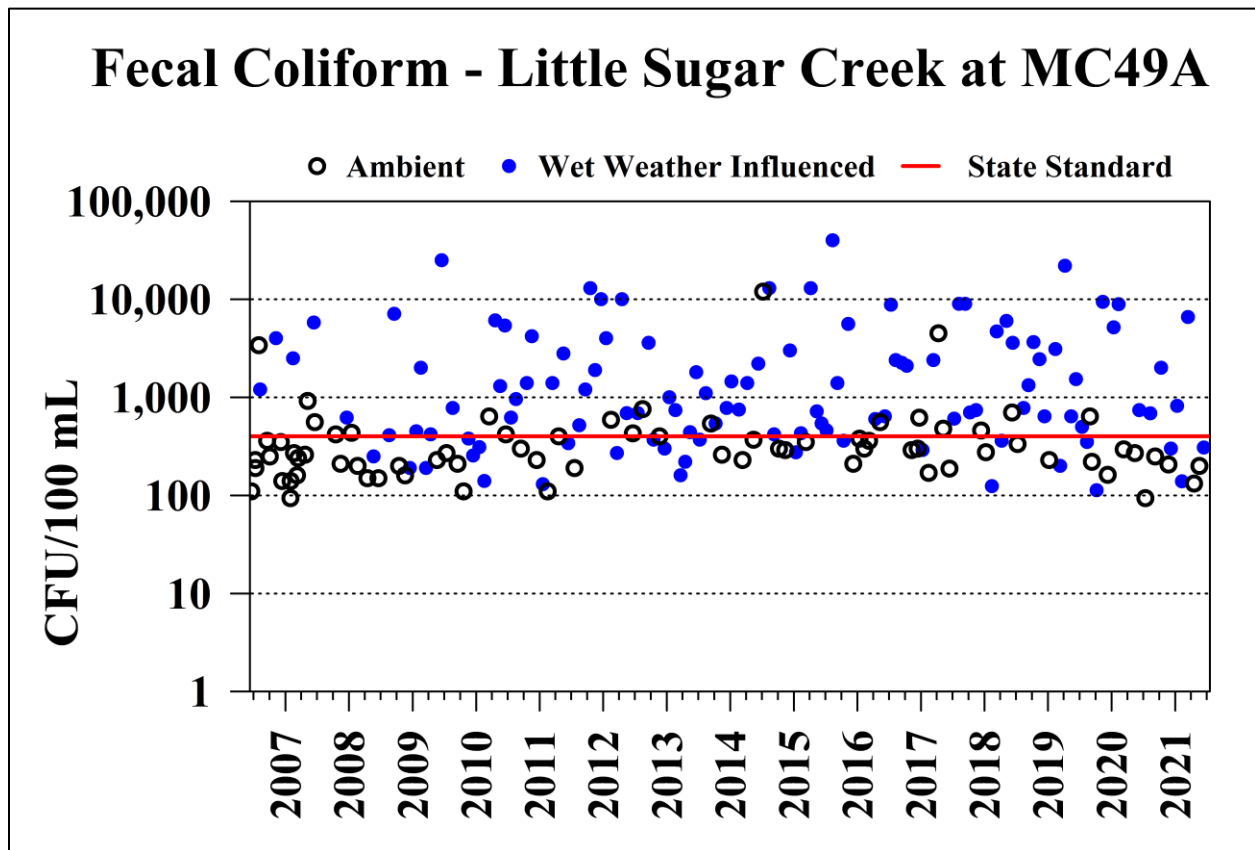


Figure 11-5: Little Sugar Creek –MC49A - Overall Monitoring Data

A total of 184 samples have been collected at MC29A-1 over this period under the fixed interval monitoring program (**Figure 11-6**). Of these, 79% exceeded the 400 cfu/100mL State standard with 90% confidence. Exceedances tended to be more frequent and more extreme under wet weather influenced sampling conditions (meaning some precipitation within the County in the 72-hour preceding the sampling event); however, exceedances did occur under both ambient and wet weather influenced conditions.

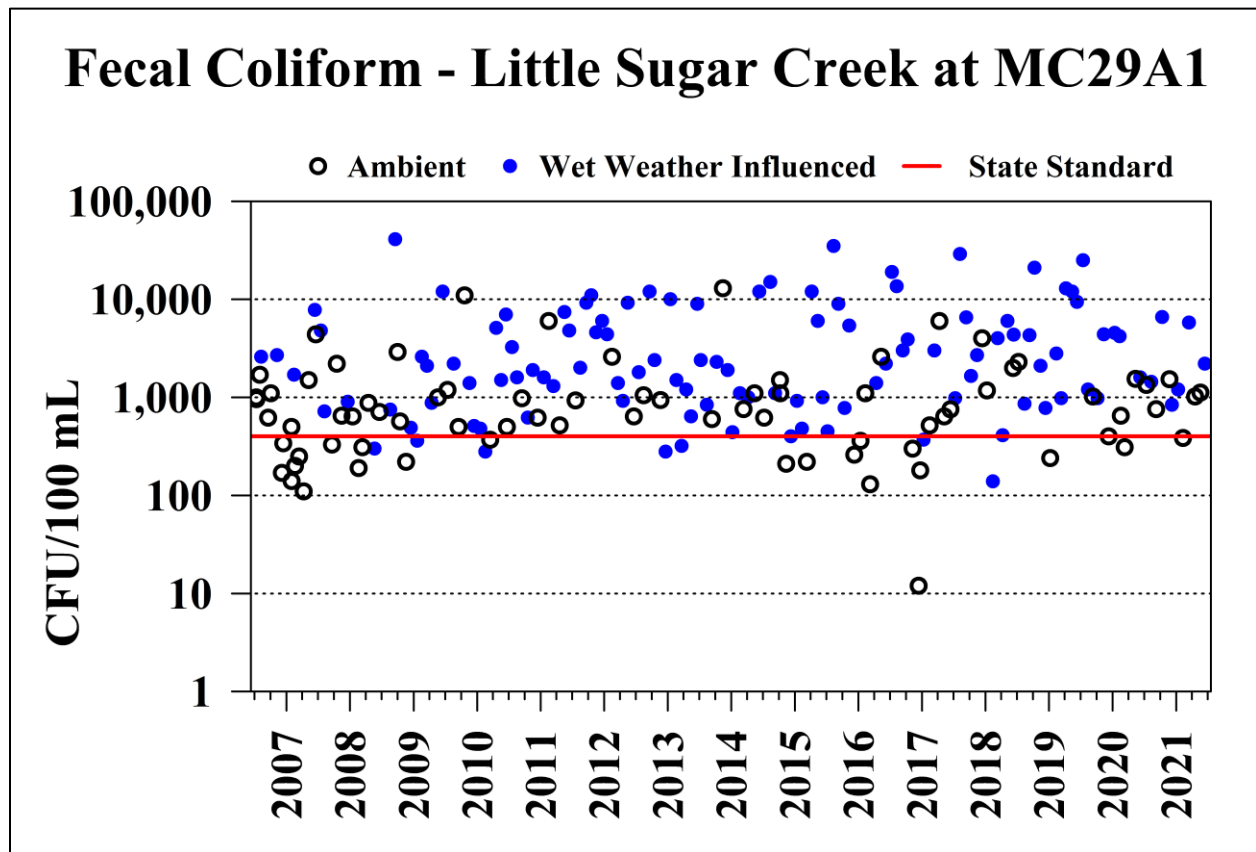


Figure 11-6: Little Sugar Creek –MC29A-1 - Overall Monitoring Data

11.4.1.5 McAlpine Creek Watershed

There are two monitoring locations on McAlpine Creek, MC45B just downstream of the North Carolina/South Carolina border, and MC38 downstream of the confluence with Campbell Creek and Irvins Creek. An initial assessment of available watershed and surface water quality data was conducted utilizing fixed interval stream data for fecal coliform collected at these two monitoring locations.

From July 2006 through June 2021, a total of 183 samples were collected at MC45B under the fixed interval monitoring program (**Figure 11-7**). Of these, 36% exceeded the 400 cfu/100mL State standard with 90% confidence. Exceedances tended to be much more frequent under wet weather influenced sampling conditions (meaning some precipitation within the County in the 72-hour preceding the sampling event); however, exceedances did occur under both ambient and wet weather influenced conditions.

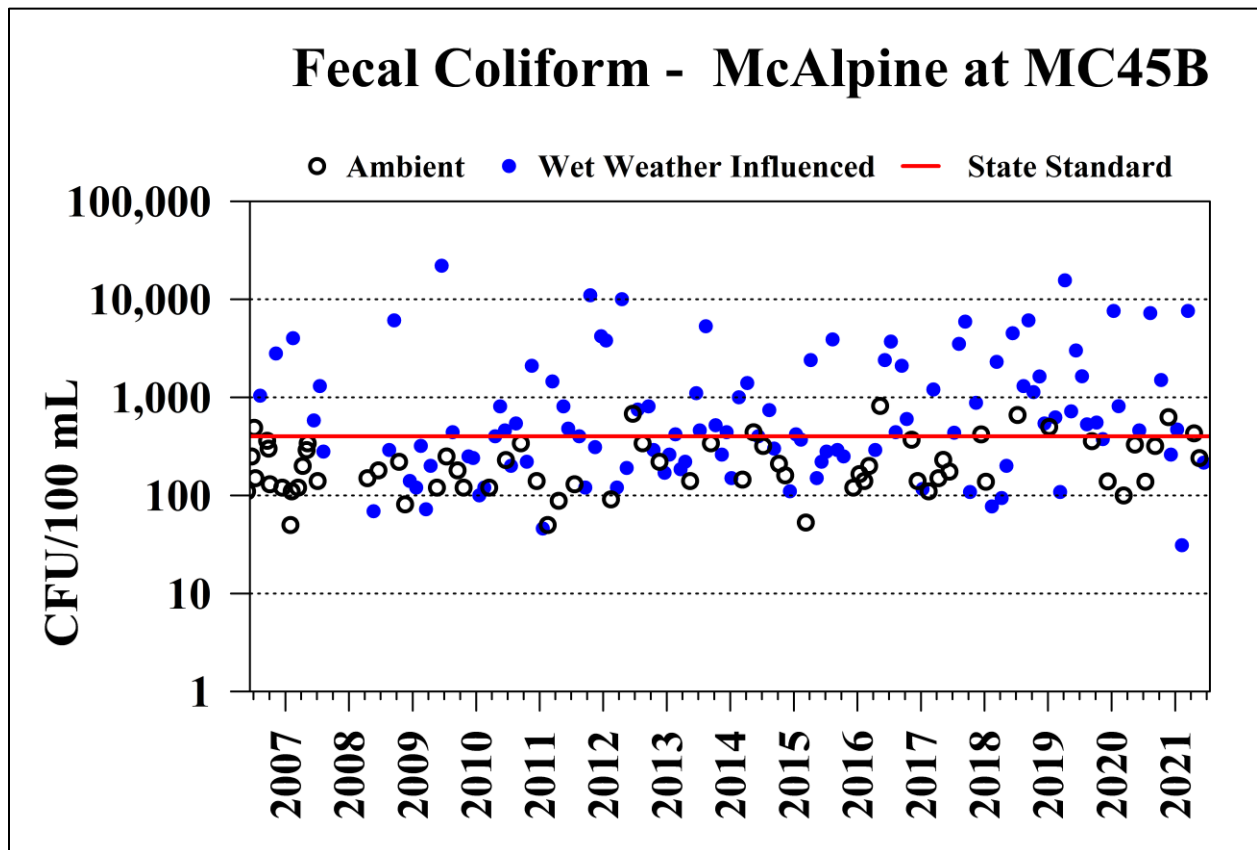


Figure 11-7: McAlpine Creek –MC45B - Overall Monitoring Data

A total of 189 samples have been collected at MC38 over this period under the fixed interval monitoring program (**Figure 11-8**). Of these, 48% exceeded the 400 cfu/100mL State standard with 90% confidence. Exceedances tended to be much more frequent and more extreme under wet weather influenced sampling conditions (meaning some precipitation within the County in the 72-hour preceding the sampling event); however, exceedances did occur under both ambient and wet weather influenced conditions.

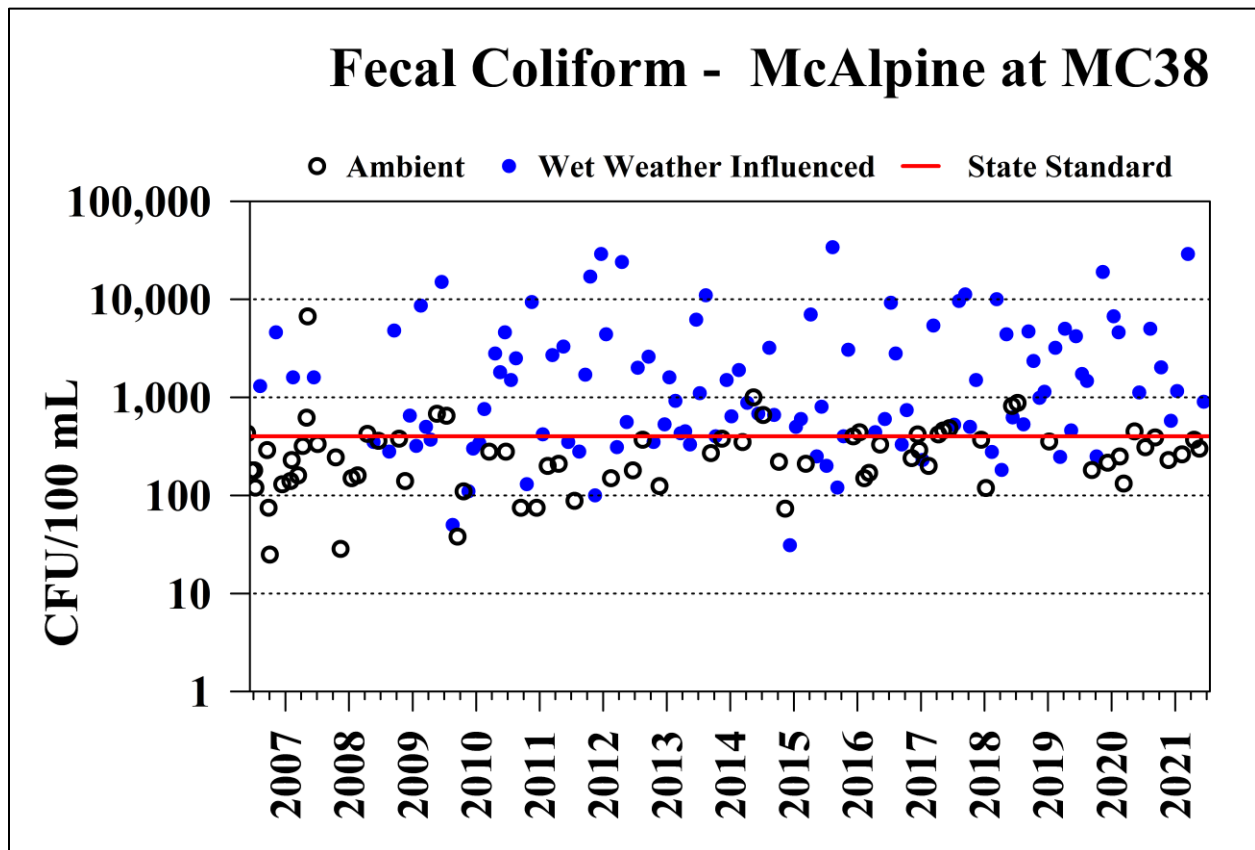


Figure 11-8: McAlpine Creek –MC38 - Overall Monitoring Data

11.4.1.6 Fecal Coliform Summary

The State standard for fecal coliform is exceeded by more than 10% with 90% confidence for all watersheds with a fecal coliform TMDL identified above, based on fixed interval data collected between 2006 and 2021. These exceedances are more common in wet weather influenced conditions, but exceedances also occurred during ambient conditions in each of these watersheds. Since exceedance rates are highly influenced by wet weather, long term variations in the exceedance rates should account for how many samples in a given year are influenced by wet weather conditions. A higher percentage of wet weather events on fixed interval sampling days is expected to result in a higher percentage of samples that exceed surface water quality standards. Since “wet weather” is defined as at least 0.1 inches of rainfall recorded anywhere in the City of Charlotte/Mecklenburg County in the 72 hours prior to sampling, future analysis may also attempt to utilize rain gages in closer proximity to each monitoring station to more accurately verify whether a sample was influenced by wet weather conditions, as rainfall in one part of the City/County does not necessarily mean it is raining everywhere in the City/County.

11.4.2 Turbidity

As discussed in sub-section 11.2, the turbidity TMDL developed in 2005 included five Charlotte-Mecklenburg watersheds but only developed a WLA for turbidity for Long Creek since the

surface water quality data assessment performed for the TMDL demonstrated that the remaining four watersheds had less than a 10% exceedance rate of the 50 NTU State standard. Therefore, this sub-section includes an assessment of turbidity data only for Long Creek.

11.4.2.1 Long Creek Watershed

An initial assessment of available watershed and surface water quality data was conducted utilizing stream data for turbidity collected at the CMSWS monitoring site MC14A on Long Creek. From July 2006 through June 2021, a total of 178 samples were collected under the fixed interval monitoring program (**Figure 11-9**), with 16% exceeding the 50 NTU State standard with 90% confidence. These exceedances all occurred under wet weather conditions.

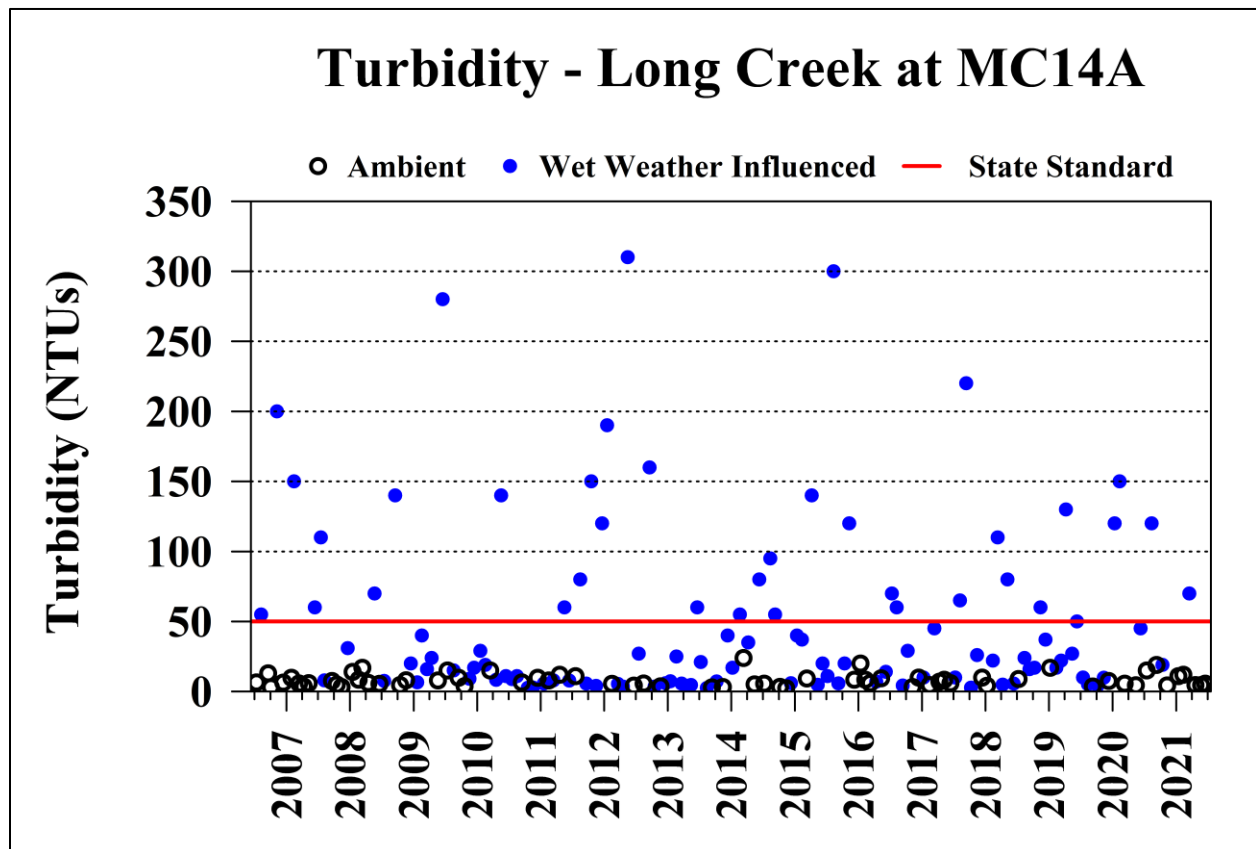


Figure 11-9: Long Creek –MC14A - Overall Monitoring Data

11.4.3 Dissolved Oxygen

As stated in sub-section 11.2, the 1996 dissolved oxygen (“DO”) TMDL for Irwin Creek, McAlpine Creek, and Little Sugar Creek did not include a MS4 NPDES WLA. Nevertheless, since the City’s NPDES MS4 permit states in Part II, Section J.3, for approved TMDLs where a MS4 NPDES WLA for the pollutant of concern is not assigned to the MS4, the Permittee is still required to “evaluate strategies and tailor BMPs within the scope of the six minimum permit

measures to address the pollutant of concern in the watershed(s) to which the TMDL applies.” For this reason, the dissolved oxygen data is provided below in **Figures 11-10 through 11-14**.

Unlike the other parameters, for dissolved oxygen the State standard is violated when concentrations go below the standard rather than exceeding the standard. Based on the fixed interval sampling conducted between July 2006 and June 2021, only one sample collected from a TMDL watershed was lower than the instantaneous State standard of 4 mg/L. On October 10, 2017, a value of 3.81 mg/L was recorded at McAlpine Creek (MC38). No other sample violated the standard during this period of record. The 2018 NC Integrated Report categorizes each of these watersheds as 1i for DO, meaning that they have a TMDL but are not impaired and are supporting their designated uses.

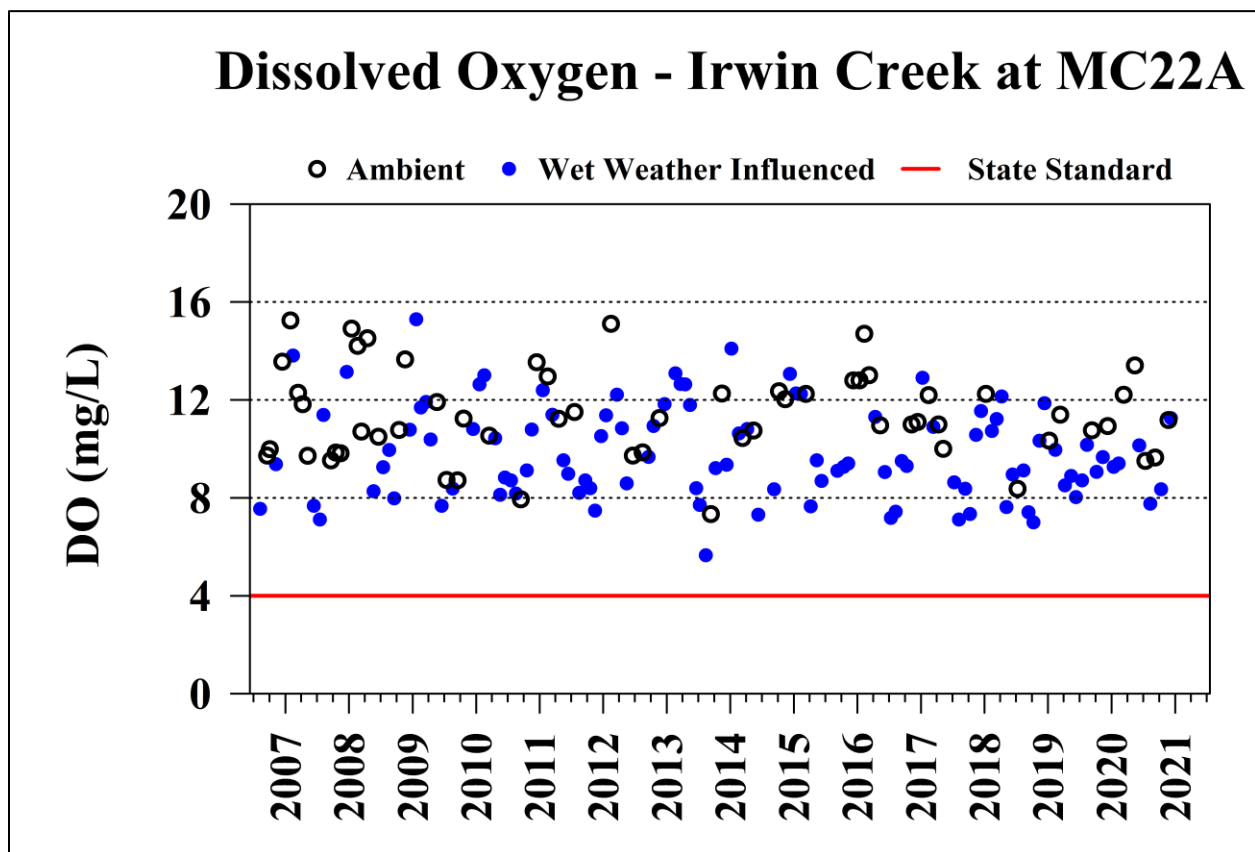


Figure 11-10: Irwin Creek–MC22A - Overall Monitoring Data

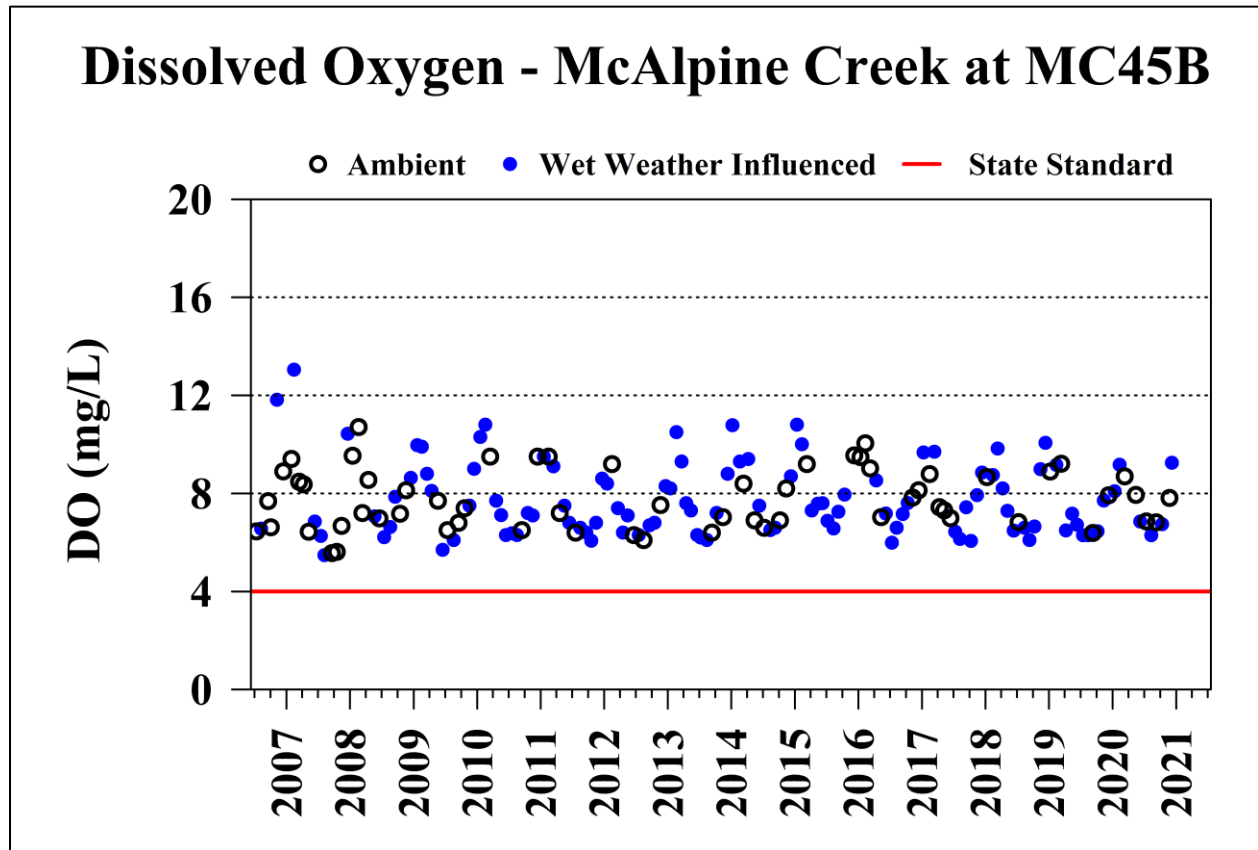


Figure 11-11: McAlpine Creek –MC45B - Overall Monitoring Data

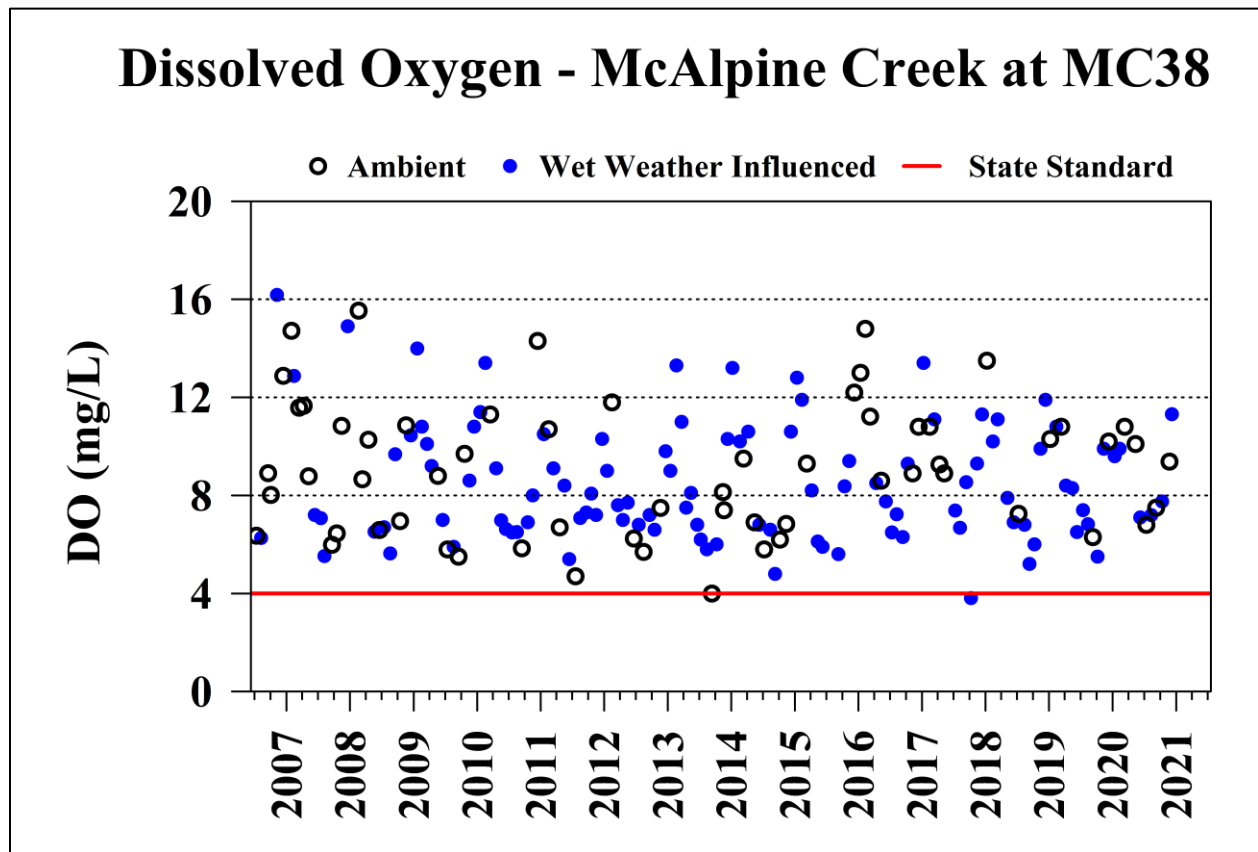


Figure 11-12: McAlpine Creek –MC38 - Overall Monitoring Data

Dissolved Oxygen - Little Sugar Creek at MC49A

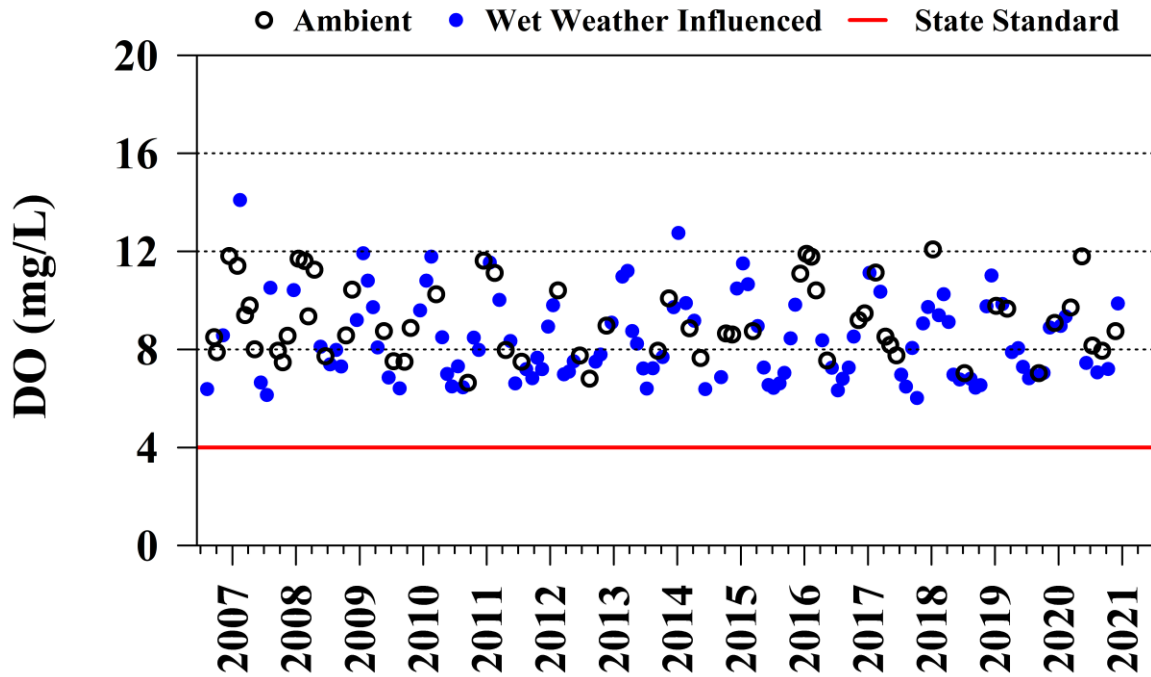


Figure 11-13: Little Sugar Creek –MC49A - Overall Monitoring Data

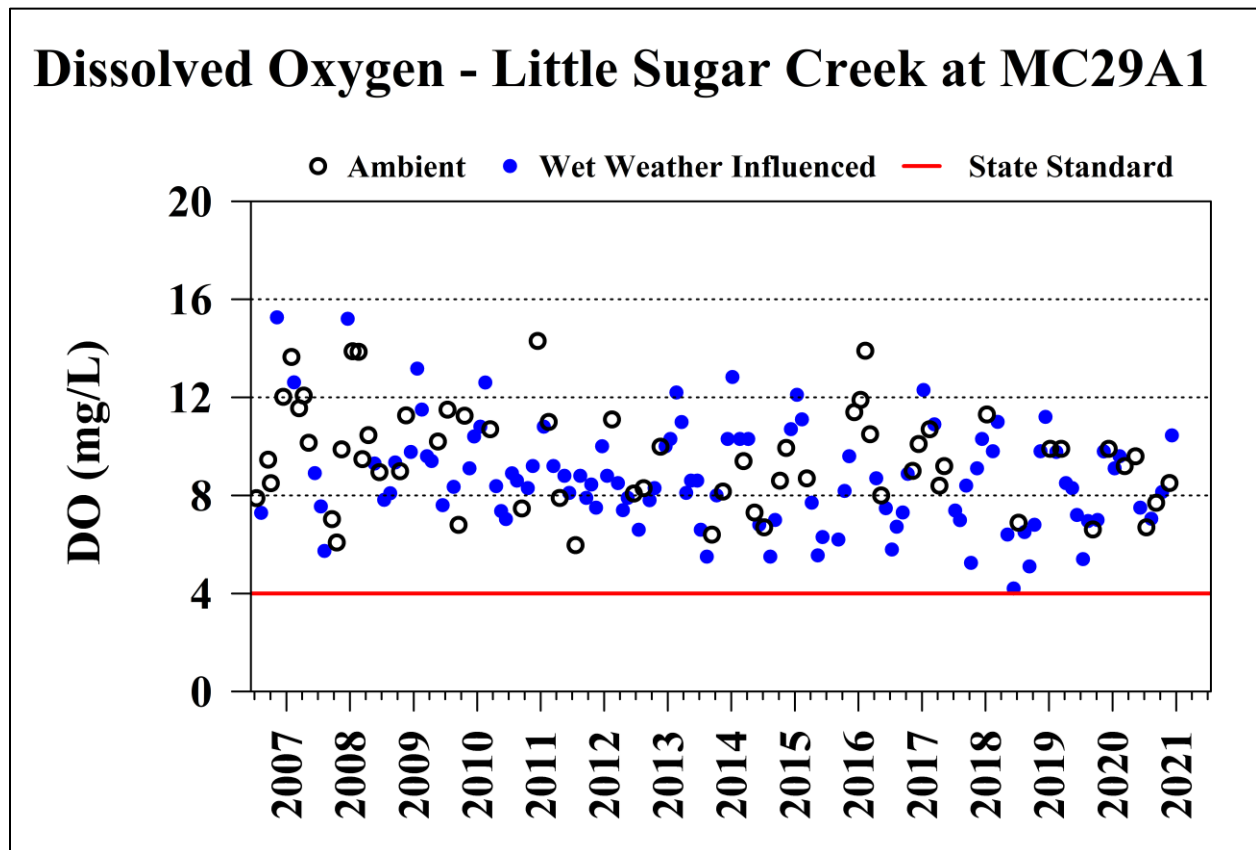


Figure 11-14: Little Sugar Creek –MC29A-1 – Overall Monitoring Data

11.4.4 Chlorophyll a

As stated in sub-section 11.2, Mecklenburg County is responsible for providing annual assessment reports for the Lake Wylie chlorophyll-a TMDL under their NPDES MS4 permit program.

11.4.5 Mercury

NCDEQ did not consider it necessary to include an MS4 NPDES WLA for mercury in their statewide TMDL. For this reason, mercury data is not analyzed under the City’s TMDL Watershed Plan.

11.5 Monitoring Plan for Assigned MS4 NPDES Regulated Waste Load Allocation

As part of the TMDL watershed plan the City developed a monitoring plan for each pollutant of concern with an assigned MS4 NPDES regulated WLA within each watershed with an approved TMDL within the City’s jurisdiction. The purpose of the monitoring plan is to guide activities for data collection and assessment of pollutants of concern as well as to evaluate the effectiveness of achieving the regulated waste load allocation (WLA) identified within the TMDL. In developing the monitoring plan, sample locations were selected to assess surface

water quality conditions within each TMDL watershed. Additional information concerning the monitoring plan is provided in the City’s TMDL Watershed Plan referenced in section 11.2.

11.6 Identification of Additional Measures

As part of the TMDL watershed plan, the City identified additional measures for implementation within the City’s MS4 permit program that are designed to achieve the assigned MS4 NPDES regulated WLA and to reduce the TMDL pollutant of concern to the MEP within the watershed to which the TMDL applies. The plan also discusses how the additional measures are designed to reduce the TMDL pollutant of concern. Additional information concerning these measures is provided in the City’s TMDL Watershed Plan referenced in section 11.2.

11.7 Implementation of Additional Measures

The TMDL watershed plan was updated to discuss the implementation of the additional programs and measures identified in sub-section 11.6. Additional information concerning these measures is provided in the City’s TMDL Watershed Plan referenced in section 11.2 above.

11.8 Tracking Incremental Success

BMP data parameters were identified to track incremental success within the TMDL watershed plan. These parameters and corresponding data for the report period are shown in sub-section 11.10 below.

11.9 Measurable Goals

Table 11-3 describes the various Total Maximum Daily Load (TMDL) Program BMPs and the Measurable Goals for each BMP by permit term year. These BMPs pertain to the City’s existing TMDL watershed plan that was developed under the City’s previous NPDES MS4 permit.

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Table 11-3: BMP Measurable Goals for Total Maximum Daily Load (TMDL) Program.

BMP	BMP Description	Measurable Goals (by permit term year)				
		1	2	3	4	5 ⁺
Identify, describe and map watershed, outfalls, and streams	<p>Within 24 months the permittee shall prepare a plan that:</p> <ul style="list-style-type: none"> Identifies the watershed(s) subject to an approved TMDL with an approved Waste Load Allocation (WLAs) assigned to the permittee, Includes a description of the watershed(s), Includes a map of watershed(s) showing streams & outfalls Identifies the locations of currently known major outfalls within its corporate limits with the potential of contributing to the cause(s) of the impairment to the impaired segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments and Includes a schedule to discover and locate other major outfalls within its corporate limits that may be contributing to the cause of the impairment to the impaired stream segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments. 	None	Develop TMDL Watershed Plan per requirements of the MS4 permit by Feb 28, 2015.	Update TMDL Watershed Plan as necessary. (On-going, years 3 – 5 ⁺)		
Existing measures	<p>Within 24 months the Permittee's plan:</p> <ul style="list-style-type: none"> Shall describe existing measures being implemented by the Permittee designed to achieve the <u>MS4's NPDES WLA</u> and to reduce the TMDL pollutant of concern to the MEP within the watershed to which the TMDL applies; and Provide an explanation as to how those measures are designed to reduce the TMDL pollutant of concern. The Permittee shall continue to implement the existing measures until notified by DWQ. 	None	Identify existing measures within TMDL plan by Feb 28, 2015.	Continue to implement existing measures per TMDL plan. (On-going, years 3 – 5 ⁺)		
Assessment of available monitoring data	Within 24 months the permittee's plan shall include an assessment of available monitoring data. Where long-term data is available, this assessment should include an analysis of the data to show trends.	None	Conduct a review and assessment of available monitoring data by Feb 28, 2015.	Continue to review and assess monitoring data as it becomes available. (On-going, years 3 – 5 ⁺)		

Monitoring Plan	Within 36 months the permittee shall develop and submit to the Division a Monitoring Plan for the permittee's assigned NPDES regulated WLA as specified in the TMDL. The permittee shall maintain and implement the Monitoring Plan as additional outfalls are identified and as accumulating data may suggest. Following any review and comment by the Division the permittee shall incorporate any necessary changes to monitoring plan and initiate the plan within six months. Modifications to the monitoring plan shall be approved by the Division. Upon request, the requirement to develop a Monitoring Plan may be waived by the Division if the existing and proposed measures are determined to be adequate to achieve the MS4's NPDES WLA to MEP within the watershed to which the TMDL applies.	None	None	Develop monitoring plan for each TMDL watershed for the TMDL pollutants of concern by Feb 28, 2016.	Complete monitoring activities specified in the plan by June 30, 2017. Assess monitoring data collected under the monitoring plan to determine effectiveness of Water Quality Programs by December 31, 2017. Update monitoring plan as necessary based on data review and assessment activities.	Complete monitoring activities specified in the plan by June 30, 2018. Assess monitoring data collected under the monitoring plan to determine effectiveness of Water Quality Programs by December 31, 2018. Update monitoring plan as necessary based on data review and assessment activities.
Additional Measures	Within 36 months the permittee's plan shall: <ul style="list-style-type: none"> Describe additional measures to be implemented by the permittee designed to achieve the permittee's MS4's NPDES WLA and to reduce the TMDL pollutant of concern to the MEP within the watershed to which the TMDL applies; and Provide an explanation as to how those measures are designed to achieve the permittee's MS4's NPDES regulated WLA to the MEP within the watershed to which the TMDL applies. 	None	None	Determine additional measures that may be needed to achieve assigned MS4 NPDES regulated WLA and address TMDL pollutant of concern by Feb 28, 2016.	Continue to evaluate and update additional measures per TMDL plan, as needed. (On-going, years 4 – 5 ⁺)	
Implementation Plan	Within 48 months the permittee's plan shall: <ul style="list-style-type: none"> Describe the measures to be implemented within the remainder of the permit term designed to achieve the MS4's NPDES WLA and to reduce the TMDL pollutant of concern to the MEP and Identify a schedule, subject to DWQ approval, for completing the activities. 	None	None	None	Develop an implementation plan for identified additional measures that may be needed to achieve assigned MS4 NPDES regulated WLA and address TMDL	Continue to implement additional measures per the plan.



					pollutant of concern by Feb 28, 2017.	
Incremental Success	The permittee's plan must outline ways to track and report successes designed to achieve the MS4's NPDES regulated WLA and to reduce the TMDL pollutant of concern to MEP within the watershed to which the TMDL applies.	None	None	None	Develop a methodology to track and report data and successes for identified additional measures that may be needed to achieve assigned MS4 NPDES regulated WLA and address TMDL pollutant of concern by June 30, 2017.	Continue to track and report successes per the plan.
Reporting	The permittee shall conduct and submit to the Division an annual assessment of the program designed to achieve the MS4's NPDES WLA and to reduce the TMDL pollutant of concern to the MEP within the watershed to which the TMDL applies. Any monitoring data and information generated from the previous year are to be submitted with each annual report.	None	Prepare an annual assessment of activities and data analysis for the TMDL watershed plan. Provide this information in the NPDES MS4 permit annual report. (On-going, years 2 – 5+)			

11.10 Program Assessment and Reporting

The overall TMDL Program and Watershed Plan were successfully accomplished during the annual report period. **Table 11-4** shows a summary of the various BMPs implemented and corresponding data results per TMDL watershed for the report period. BMPs that apply to the City or a program as a whole, such as television advertisements, cannot be differentiated by watershed and are therefore reported as “Citywide.” Additional information concerning these BMPs is provided in the City’s TMDL Watershed Plan referenced in sub-section 11.2.

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Table 11-4: TMDL Program Summary for FY2021

TMDL WATERSHED BMP	Citywide	Irwin	Lake Wylie	Little Sugar	Long	McAlpine	McKee	Steele	Sugar
Public Education and Outreach									
Television advertising spots	310								
Radio advertising spots	353								
Social media posts	986								
Social media engagements	14,819								
Public requests to stormwater hotline – WQ related	445								
School presentations		2	3	4	2	4	0 ¹ .	0 ¹ .	6
Students educated at school presentations		16	221	121	148	141	0 ¹ .	0 ¹ .	215
Public presentations	29								
Citizens educated at public presentations	1,211								
Public events	5								
Attendees interacted with at public events	50								
Website page views	417,437								
Website unique page views	176,924								
Utility bill inserts		152,981	64,881	316,633	86,535	334,394	11,506	48,566	62,719
CMCSI education workshops conducted (in-person)	0								
Persons trained on CMCSI	257								
Environmental notices and brochures distributed	14								
Flow Free (Fats Oils & Grease-FOG) brochures distributed	3,333								
Flow Free (FOG) presentations	2								
Citizens educated during Flow Free (FOG) presentations	160								

1. Activity not conducted in this watershed during fiscal year 2021.



TMDL WATERSHED BMP	Citywide	Irwin	Lake Wylie	Little Sugar	Long	McAlpine	McKee	Steele	Sugar
Public Involvement									
Storm drains marked		261	0 ¹ .	85	95	37	0 ¹ .	55	53
Adopt-A-Stream trash removed (lbs.)		11,779	0 ¹ .	25,246	0 ¹ .	4,905	0 ¹ .	900	2,999
Adopt-A-Stream miles cleaned		17	0 ¹ .	49	0 ¹ .	26	0 ¹ .	0.35	9
Big Spring Clean trash removed (lbs.)		0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .
Big Spring Clean stream miles cleaned		0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .
Volunteer Monitoring samples collected		4	0 ¹ .	45	0 ¹ .	13	0 ¹ .	22	0 ¹ .
Volunteer Monitoring visual observations		4	0 ¹ .	21	0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .
Trees planted during tree planting volunteer events	245								
Adopt-A-Street bags of trash collected	2,422								
Adopt-A-Street bags of recyclables collected	262								
Adopt-A-Street miles cleaned	402								

1. Activity not conducted in this watershed during fiscal year 2021.



TMDL WATERSHED BMP	Citywide	Irwin	Lake Wylie	Little Sugar	Long	McAlpine	McKee	Steele	Sugar
Illicit Discharge Detection and Elimination (IDDE)									
Stream walk miles inspected		74	0 ^{1.}	0 ^{1.}	92	0 ^{1.}	18	0 ^{1.}	0 ^{1.}
Stream walk outfalls inspected		196	0 ^{1.}	0 ^{1.}	50	0 ^{1.}	64	0 ^{1.}	0 ^{1.}
Dry weather flows detected		69	0 ^{1.}	0 ^{1.}	5	0 ^{1.}	2	0 ^{1.}	0 ^{1.}
Dry weather flows sampled		8	0 ^{1.}	0 ^{1.}	0 ^{1.}	0 ^{1.}	1	0 ^{1.}	0 ^{1.}
Stream walk IDDE problems detected/corrected		8	0 ^{1.}	0 ^{1.}	5	0 ^{1.}	1	0 ^{1.}	0 ^{1.}
Multi-family sewer system inspections		1	0 ^{1.}	27	0 ^{1.}	13	0 ^{1.}	0 ^{1.}	4
Multi-family community personnel educated	50								
Stormwater pollution ordinance violations/NOVs issued		20	5	29	6	15	0 ^{1.}	2	10
Stormwater pollution ordinance penalty enforcements issued		3	0 ^{1.}	1	0 ^{1.}	1	0 ^{1.}	1	1
Septic system failures detected/corrected		0 ^{1.}	0 ^{1.}	0 ^{1.}	7	3	0 ^{1.}	0 ^{1.}	0 ^{1.}
Municipal employees trained on IDDE	1,034								
Sanitary sewer use ordinance NOVs issued	50								
Sanitary sewer system pretreatment inspections	120								
Sanitary sewer system FOG inspections	3,287								
Sanitary sewer system pipe miles cleaned	941								
Sanitary sewer system ROW miles cleared	106								
Sanitary sewer system miles re-lined	10.1								
Sanitary sewer system manholes inspected	22,772								
Sanitary sewer system lift stations maintained	155								
Sanitary sewer system overflows corrected	152								
Pet waste flagging events conducted	9								
IDEP business corridor inspections		5	0 ^{1.}	11	1	5	0 ^{1.}	2	5
IDEP outfall inspections		1	0 ^{1.}	0 ^{1.}	0 ^{1.}	0 ^{1.}	0 ^{1.}	0 ^{1.}	0 ^{1.}
IDEP problems detected/corrected		1	0 ^{1.}	1	0 ^{1.}	1	0 ^{1.}	0 ^{1.}	0 ^{1.}
IDEP fecal samples collected		1	0 ^{1.}	0 ^{1.}	0 ^{1.}	0 ^{1.}	0 ^{1.}	0 ^{1.}	0 ^{1.}
Citizen service requests responded to		71	11	156	30	110	2	15	32

1. Activity not conducted in this watershed during fiscal year 2021.



TMDL WATERSHED BMP	Citywide	Irwin	Lake Wylie	Little Sugar	Long	McAlpine	McKee	Steele	Sugar
Construction Site Stormwater Runoff Control									
Erosion control ordinance NOVs issued	35								
Erosion control ordinance civil penalties issued	20								
Project/site plans reviewed	1,293								
Sites inspected	5,044								
Post-Construction Stormwater Management									
Post-Construction ordinance NOVs and CARs issued	711								
Post-Construction ordinance penalties issued	7								
Post-Construction education workshops conducted	1								
Citizens educated at Post-Construction workshops	124								
Project/site plans reviewed	162								
Buffer protected/added (acres)	215								
Buffer mitigation plans approved									
Buffer mitigation information requests addressed		40	100	100	30	50	30	50	50
SCMs added		15	7	17	9	6	6	12	12
SCMs inspected		87	70	146	61	202	4	85	203
Pollution Prevention/Good Housekeeping									
City facilities inspected		17	0 ¹	23	3	10	0 ¹	2	12
City facility outfalls inspected		38	0 ¹	42	3	15	0 ¹	2	37
Stormwater pollution prevention plans implemented		9	0 ¹	9	0 ¹	3	0 ¹	0 ¹	6
Spill prevention response plans implemented		9	0 ¹	9	0 ¹	3	0 ¹	0 ¹	6
Catch basins top cleaned	26,603								
Catch basins cleaned (entire basin)	824								
Stormwater pipelines cleaned (feet)	8,395								
Street sweeping (miles swept)	42,870								
Street sweeping debris (tons)	907								
Yard waste collected (tons)	51,054								

1. Activity not conducted in this watershed during fiscal year 2021.



TMDL WATERSHED BMP	Citywide	Irwin	Lake Wylie	Little Sugar	Long	McAlpine	McKee	Steele	Sugar
Industrial Facilities									
Industrial facilities inspected		14	2	6	5	0 ¹ .	0 ¹ .	5	7
Industrial facility outfalls inspected		28	4	7	7	0 ¹ .	0 ¹ .	13	17
Vehicle maintenance facilities inspected		3	0 ¹ .	12	0 ¹ .	1	0 ¹ .	0 ¹ .	4
Industrial facilities monitored		0 ¹ .	0 ¹ .	3	1	1	0 ¹ .	0 ¹ .	3
Illicit discharges or connections detected/corrected		3	0 ¹ .	2	0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .	0 ¹ .
Surface Water Quality Monitoring									
Fixed interval TSS samples collected		13	0 ¹ .	52	13	65	13	13	26
Fixed interval Turbidity samples collected		13	58	52	13	65	13	13	26
Fixed interval Dissolved Oxygen samples collected		12	72	48	12	60	12	12	26
Fixed interval Fecal Coliform samples collected		13	73	60	13	70	13	13	26
CMANN Turbidity observations/readings ² .		5,996	3,312	54,798	5,016	15,594	6,360	4,186	11,756
CMANN Dissolved Oxygen observations/readings ² .		7,414	4,515	70,422	6,053	21,378	5,999	6,877	15,250
Action/watch level follow-up investigations conducted ³ .		0 ¹ .	0 ¹ .	1	0 ¹ .	1	0 ¹ .	0 ¹ .	0 ¹ .

1. Activity not conducted in this watershed during fiscal year 2021.

2. CMANN is an automated monitoring network that collects data readings typically once per hour (select sites collect readings every 15 min.). Data reported is QA/QC accepted data only.

3. Includes Fixed Interval and CMANN program investigations.



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